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## ORIGINAL ARTICLES.

### THE DIAGNOSIS OF MALARIAL FEVER.[1]


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AMONG a multitude of points of great interest in malarial fever the following may be emphasized:

1. It was the disease best known to the old Greek and Roman physicians, some of whom gave very clear clinical pictures of the chief varieties.

2. It remains, after two hundred years, the only acute infectious disease for which we have a positive specific.

3. It is the most important known disease due to protozoon parasites.

4. North of Mason and Dixon's line physicians are prone to diagnose malaria for other diseases; south of the line they are more prone to diagnose other diseases for malaria; in both regions it is a source of greater errors in vital statistics than any other affection.

It is not my intention to bore you with any detailed account of the hematozoon malariæ, but I would remind you that there are three well recognized varieties. (1) The tertian organism, which matures in forty-eight hours and produces quotidian paroxysms if two groups are present, tertian if there be only one. This is the common parasite of the simple intermittents of the spring and early autumn. (2) The quartan parasite, which has a cycle of development of seventy-two hours, and, if only one group of organisms is present, causes the regular quartan intermittent; if two or more groups are present, the paroxysms may be daily or every other day. The quartan parasite is a rare form. There have been only about fifteen cases among 1000 examined at my clinic. (3) The parasite of the irregular malarial fevers (estivo-autumnal form)—the remittent, continued, and pernicious types. This variety is smaller, less easily recognized, is not so abundant in the peripheral circulation, and, in the pernicious forms, may have curious seats of election, as in the brain or intestines. It is further characterized by the development of the crescents, a distinctive and characteristic form of great moment in diagnosis.

The recognition of the invariable association of these parasites with all forms of malarial fevers, of their etiological relation to the disease, and of their importance in diagnosis, has resulted from the labors of Laveran, and of his followers in Italy, and in this country. I cannot forbear a word of warm commendation of the way in which our Italian colleagues have persistently followed, and with such success, the many problems connected with the life history of the parasite. Anyone who wishes to keep abreast of the world's work on malaria must know the Italian literature. Much remains to be worked out—the relations of these varieties to each other, the significance of the crescents and of the flagellate form, the life history outside the body, and the mode of infection. Is it a facultative parasite? Is it possible that in infected districts persons may harbor it and show no symptoms, as is the case with the filaria and the anchylostoma? How long may it lie *perdu*, so to speak, in the body?—surely questions enough to satisfy the cravings of the younger generation of workers.

A word before I pass on to the subject in hand. To obtain a correct knowledge of the forms of the malarial parasite requires months of careful study, with plenty of material. There have been papers published in this country and in India which bear ample evidence that the authors have approached the problem without due technical preparation. Two educational points are particularly to be noted: the changes which the red corpuscles undergo on a slide after twenty-four hours on the warm stage, and the irregular forms of vacuoles which are not infrequent in the red corpuscles in some fevers, particularly scarlet fever and measles. I would urge particularly as a *sine qua non* in all doubtful cases, and especially in supposed mixed infections, as with malaria and typhoid fever, that cover slip specimens of the blood be preserved, which, if necessary, could be submitted to the judgment of an acknowledged expert.

The recognition of malaria is fortunately in a large majority of all cases a very easy matter. The subject for discussion may be indicated under three headings: 1. The diagnosis of the regular malarial intermittent fevers. 2. The diagnosis of the irregular remittent and pernicious forms. 3. The spurious malaria of the Health Boards.

#### I. THE SIMPLE INTERMITTENTS.

The tertian infection, the only common one in this

[1] Read before the Medical Society of the County of New York, February 22, 1897.

country, is characterized by a paroxysm developing at the end of forty-eight hours, if a single group of parasites is present; at the end of twenty-four hours, if two groups exist, one of which maturates every day. There are three features by which an ague can be recognized:

(*a*) The character of the febrile paroxysms. Take any large series of carefully recorded temperature charts, such as have been made in my wards during the past seven years,[1] and it is found that the duration of the pyrexia from the rise above 99° F. to the fall to normal is from eleven to twelve hours, rarely shorter, still more rarely longer.

(*b*) The blood shows the hematozoa in all stages of development. Practically they are never absent in uncinchonized individuals. There is no leucocytosis.

(*c*) The administration of quinin checks the further development of paroxysms and causes a rapid disappearance of the parasites.

During last year I saw in private, or there were brought to my wards, cases with intermittent paroxysms of fever believed to be due to malaria, but which subsequently proved to be the following conditions: abscess of the liver, tuberculosis, influenza, gonorrhea, endocarditis, otitis media, gall-stone fever, post-partum anemia, typhoid fever, and septicemia. There are other affections, such as syphilis and many obscure septic infections, with which recurring chills may be associated. There are also remarkable cases of cryptogenetic septicemia with daily chills—cases in which tuberculosis and malaria can be almost positively excluded. Dreschfeld of Manchester has described a form of this as idiopathic intermittent fever of pyemic character. It must be confessed that the regularity of the chills, often of a quotidian or tertain type, and the obscurity of the cause, make the disguise very complete. The three points just referred to suffice, as a rule, to clear up the diagnosis. The length of the paroxysm in septic cases is rarely so long and not so fixed in recurring attacks. Shorter periods of pyrexia, six to eight hours, are the rule; occasionally they are longer, eighteen to twenty-four hours. This point, together with the presence of a leucocytosis, the great increase in the blood plates, the absence of the hematozoa, and the resistance to quinin, serve to exclude malarial infection. To one or two of these conditions I may refer briefly.

It is not sufficiently recognized in the profession, particularly in malarious regions, that pulmonary tuberculosis very frequently sets in with chills and fever. In Baltimore I not infrequently see cases in which the patient has been treated persistently with quinin, until the aggravation of the cough, or the occurrence of hemoptysis has aroused the suspicion that the lungs were affected.

Abscess of the liver is almost always at first treated for malaria. The recurring chills and fever, and the sallow tint, lead, not unnaturally, to this mistake, which is made even in regions in the North which are quite free from paludism.

Another condition of the liver is a common source of error, namely, gall-stone fever. I do not refer to the chill during the passage of the gall stone, nor to the recurring chills in the pyemia of suppurative cholangitis, but to the recurring paroxysms of intermittent fever for months or even for years in connection with the lodgment of a stone in the common duct.

### II. THE IRREGULAR MALARIAL FEVERS.

In reality the chief difficulty in the diagnosis of malaria is in the recognition of the remittent fevers which simulate typhoid, of certain pernicious types with special localization, and of certain chronic infections. Every year we have a few cases of malarial remittents which are at first mistaken for typhoid fever and tubbed. I show you here a chart of the last case of this kind.

The patient, Edward Reip, aged twenty-one, was admitted October 2d, complaining of headache and pains through the body. He had had malaria five years ago; otherwise there was nothing of special moment in his history. On the 29th of September, three days before his admission, he had a wetting, and on the following morning awoke with a violent headache, and felt so badly that he worked with difficulty. He stopped work the day before admission. He felt cold, but had no chill. He had lost his appetite. There was no nausea and no vomiting.

When admitted his temperature was 105° F., face was slightly flushed, the tongue furred and white. The examination was negative with the exception of the spleen, which was enlarged and slightly tender. The patient looked very ill, and his temperature on the evening of admission rose to 106° F., and he was given a tub bath. For seven days this patient was treated for typhoid fever, and during this time he had thirty-two tubs. He had no chills, no sweats; the tongue was furred, the cheeks flushed, lips red; the spleen was readily palpable. The blood was examined by the house physician each day, sometimes twice a day, with negative results. On October 9th Dr. Thayer found in the peripheral blood a number of actively moving ameboid bodies. On the evening of the 9th he was given ten grains of quinin hypodermically, and then five grains every four hours. His temperature fell gradually and reached normal three days after beginning the administration of quinin. In this patient the anemia did not develop until after the end of the first week of the disease.

[1] See the Monograph by Thayer and Hewetson, "Johns Hopkins Hospital Reports," vol. v., and Dr. Thayer's article in vol. i. of the recently issued "American System of Medicine," by Loomis and Thompson.

I mention this case in detail because it illustrates a very important point in the clinical history of these cases, namely, that in certain forms of infection with the organism of the irregular malarial fever the parasites are at first very scanty in the peripheral blood, and may be, in fact, overlooked for some days.

With us it has been very much more common to mistake malaria for typhoid fever than typhoid fever for malaria. The following are the important points of differentiation:

*First. The mode of onset.*—In malarial remittent fever there is not the initial period of malaise and ill-health; the onset is more sudden; chills are much more frequent. They are not, however, always present, as in the case of which I have just spoken. On the other hand, chills at the onset of typhoid fever are not very uncommon. Of 79 cases treated during the sixth year of hospital work, in which this point was inquired about particularly, there were 13 in which the disease began with shaking chills. Epistaxis is rare in malaria.

*Second. The fever*, which presents three points of great importance in the differentiation.

(*a*) The slow, step-like ascent to the fastigium is not met with in malaria. The rise is abrupt, and on the first or second day the temperature may reach 104° or 105° F. You will see in the chart passing around that the temperature on the third day in that patient reached nearly 106° F. in itself almost enough to exclude typhoid fever.

(*b*) The malarial remittents never have the remarkable continuous type of fever which we see in typhoid after the fastigium is reached. No other disease, except pneumonia, presents the same persistent pyrexia, with perhaps not more than a degree or a degree and a half of diurnal variation. This is characteristic particularly of the second week of the disease, or from the fifth to the twelfth day. In the estivo-autumnal infections the remissions are, as a rule, marked—two, three, and even four degrees.

(*c*) In the later stages, say in the third week, when in typhoid fever there are wider excursions and marked remissions, the pyrexia in the remittent fever becomes much more broken, is apt to be more intermittent in character, and the temperature may even be subnormal for several hours of each day.

*Third. The general appearance of the patient.*—Walking through a ward containing malarial intermittent cases and typhoid fever patients one can usually pick out readily those with the former disease. The early anemia and sallowness are very characteristic. This is not the case with malarial remittent fever. During the first week the aspect may be typically typhoidal, the expression dull and heavy, and the cheeks flushed. Marked anemia and the sallow tint may not develop until the patient has been under observation for a week or more.

*Fourth.*—The gastro-intestinal, bronchitic, and nervous features offer less valuable criteria of differentiation. Herpes on the lips, when present, is important because of the great rarity in typhoid fever and the great frequency in malaria. The tongue in remittent fever is usually more coated, pasty, and white early in the disease. Bronchitis is common in both. Mental hebitude and delirium, while more common in typhoid fever, are not at all infrequent in the severer types of the estivo-autumnal fever.

*Fifth. The examination of the blood.*—The very first slide looked at may give the diagnosis. In other instances repeated examinations may be necessary, and the case to which I have referred is not at all unique in our experience. The paucity of the organisms in the peripheral circulation is very unfortunate just in these cases, as it may leave the diagnosis in doubt for several days. A systematic examination of the blood in any estivo-autumnal form is sure to be rewarded by the detection of perfectly distinctive forms, if not of the intracellular, of the characteristic crescents. Widal's test, too, will prove of great use. You will notice in the chart passing around that it was not present on October 8th, the eighth day of the patient's illness, and the day before the organisms were found in the blood, and this, with the irregular temperature, made us renew our efforts to discover the parasite.

*Sixth.*—Quinin has no influence on typhoid fever. Properly administered, it checks the malarial remittent fever in from two to four days.

There are other points of differentiation, but these are the most important.

In connection with this question there arise two important points for discussion: How far, in paludal regions, does typhoid fever present malarial aspects? It is the rooted and grounded belief of a very large section of the physicians of this country that typhoid fever very often presents "malarial features." The phrase is on their lips constantly. Failure to recognize the extraordinarily protean character of the disease is in the main responsible for this delusion, behind which lies a sort of feeling that a fever with malarial aspects is less apt to be serious. So far as my personal experience is concerned, typhoid fever is a singularly fixed disease in its composite picture, as taken, say, in centuries of cases. I saw the disease for ten years in Montreal, the General Hospital of which offered a very rich field for its study. The cases which came under my care during five years at the University and Blockley Hospitals in Philadelphia presented no essential changes. Many of the cases came from

regions infected with malaria. During the seven years and nine months in which the Johns Hopkins Hospital has been opened, there have been in my wards more than five hundred cases of typhoid fever. A considerable number of these came from the outlying districts of the city, in which malaria is very prevalent, and from which our cases of that disease come. Any one may judge from the studies on typhoid fever, issued in Reports of the Johns Hopkins Hospital, Vols. IV. and V., that the disease presents no variations from the universally recognized picture of the disease. We know nothing of typhoid fever with malarial features; on the other hand, we know a good deal, as you may judge from the chart, of malaria with typhoid features.

How often do combined infections occur with the hematozoa and Eberth's bacillus? Very seldom; much less frequently than with the pneumococcus and with the ameba coli. Among the 1000 cases of malaria and the 500 cases of typhoid fever which have been at my clinic, almost every one of which has had a blood examination, there has been but one doubtful case of double infection. So far as I know, Dr. Gilman Thompson's cases are the only satisfactory ones observed in this country. The subject is one deserving of careful study. We have been in the habit of making blood examinations in all of our typhoid cases, and as the double infection is usually with the tertian organism, I can speak with some measure of positiveness as to the accuracy of our results. I would ask particularly that in doubtful cases cover-slips be kept for expert examination. This is not a matter to be left in the hands of the inexperienced house physician. In other double infections quinin causes the hematozoa to disappear within a few days, and the case proceeds without showing signs of special influence, and this was the case, I believe, with Dr. Thompson's patients.

Certain symptoms, particularly chills and sweats, are prone to deceive the physician who has not learned to recognize them as not infrequent events in typhoid fever, associated with complications or with septic infection.[1]

I need scarcely here refer to other forms of irregular malarial fever—the more pernicious types. They are not very common with us, though in the autumn we have to be on guard constantly to avoid mistakes, and we have, as a rule, one or two fatal cases a year.

### III. SPURIOUS MALARIA.

What is spurious malaria? I do not know. One form of it is a serious and very fatal disease, killing, according to the last United States Census Report, in New York as many persons as does typhoid fever, in Brooklyn about one-third as many more. I suspect the Eberth bacillus, not the plasmodium malaria, is responsible for the major part of these cases. Other maladies, a motley host, from headache to biliousness, from keratitis to chilblains, are attributed to "a touch of malaria." Any slight ailment with a periodic tendency, any dubious trouble for which a diagnosis is not forthcoming, is put in the same category. While I do not deny that in regions where malaria is endemic, and everybody comes under its influence, many obscure troubles follow in its train, I claim that the disease in the temperate regions of this country is well defined and easily recognizable, that north of the Chesapeake the fatal forms have become so rare that no health board should take a death certificate signed "malaria" without investigation, and, lastly, that the widespread belief in an occult influence of the disease, in masked forms, and in the modification by it of other affections, has no rational basis of support.

It is just eleven years since I began the study of malarial fever in the Blockley Hospital, Philadelphia—a skeptic as to the value of Laveran's work, to which attention was called in this country by Surgeon-General Sternberg and Dr. Councilman. I soon became convinced of its truth, and the results of my study of seventy cases was published in 1887. Since that time, at certain seasons, I have had almost daily opportunity to see malarial fever, and I have of late years been fortunate in having as my associate Dr. Thayer, who has made a special study of the disease, and in Baltimore has kept us in touch with the progress of knowledge in this department. A widened experience has only served to strengthen the conviction that in the practical diagnosis of the infectious diseases, the discovery of the hematozoa of malaria by Laveran takes rank with the finding of the tuberculosis bacillus by Koch.

[1] "Chills in Typhoid Fever," *University Medical Magazine*, November, 1895.

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## BLOODLETTING IN PNEUMONIA.

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More than 41,000 people died in New York City during 1896, and of these 5383, or nearly one-seventh, died of pneumonia. These figures do not include deaths where pneumonia was a complication. We have in pneumonia, therefore, a disease which contributes more to our death-rate than any other single disease. It is a lamentable fact that, in spite of our boasted advances in medicine, the mortality from pneumonia is greater to-day than it was

fifty years ago. Townsend and Coolidge,[1] from a study of all the cases of this disease treated at the Massachusetts General Hospital from 1822 until 1889, one thousand in number, very ingeniously conclude that this increase in mortality is deceptive, and is entirely independent of treatment. The average mortality in the sixty-seven years reviewed by them was twenty-five per cent., ranging from ten per cent. in the first decade to twenty-eight per cent. in the last. They say, "This increase is deceptive, for the following reasons, all of which were shown to be a cause of a large mortality: (*a*) The average age of the patients has been increasing from the first to the last decade. (*b*) The relative number of complicated and delicate cases has increased. (*c*) The relative number of intemperate cases has increased. (*d*) The relative number of foreigners has increased. . . . These causes are sufficient to explain the entire rise in the mortality. Treatment which was heroic before 1850, transitional between 1850 and 1860, and expectant and sustaining since 1860, has not, therefore, influenced the mortality rate," nor has treatment, they add, "influenced the duration of the disease or of its convalescence."

Statistics taken from the reports of the New York Hospital show a like increase in the mortality from pneumonia, and I think, are more valuable, as they are based on a much greater number of cases.

| *Years.* | *Mortality per cent.* |
|---|---|
| 1834–1843 | 25.4 |
| 1844–1853 | 25.7 |
| 1854–1863 | 23.8 |
| 1864–1870 | 27.7 |
| 1870–1877 | Hospital closed. |
| 1877 | New hospital opened. |
| 1877–1886 | 38.8 |
| 1887–1895 | 34.7 |

As far, therefore, as hospital statistics can be relied upon as a guide, the mortality from pneumonia has increased ten per cent. or more in fifty years. We have the explanation of this increased mortality, according to Townsend and Coolidge, and they state it as their positive opinion that change of treatment has not influenced the mortality rate. Such an explanation is soothing to pride and the conscience, but I, for one, am not satisfied with it, and am fully convinced that the increased mortality in pneumonia is partly due to a change of treatment, which necessarily has been a change for the worse. In the years from 1834 to 1853, at the New York Hospital, where the mortality was a little over twenty-five per cent., the main factors in treatment were, first, an initial smart purge; second, early, copious and often-repeated bloodletting; third, increasing doses of tartar emetic, and, fourth, blisters to the chest, generally after the fever had subsided. In the years from 1854 to 1863, when the lowest mortality, 23.8 per cent., was recorded, the treatment was on about the same lines, but much less heroic. The initial purge was given, the patient was generally bled, but not heroically, and seldom more than once, tartar emetic was given in sudorific doses only, and blisters were not much in vogue. In the years from 1864 to 1869, the treatment was, as Townsend and Coolidge call it, "expectant and sustaining," and the mortality was 27.7 per cent. In 1870 the old hospital was abandoned, and the first decade in the new hospital, aseptic throughout, from 1877 to 1886, showed a mortality of 38.8 per cent. The treatment at this period was largely stimulating (alcohol, digitalis, etc.), and antipyretic with drugs, mostly quinin, depletion and derivation being confined to dry-cupping and mild purgation. During the last nine years, 1887 to 1895, the mortality has apparently diminished somewhat, having been 34.7 per cent. During this period antipyretic drugs have been used, also vascular sedatives (other than bloodletting) and stimulants; but during this time some agents promoting oxidation and elimination, principally ice-bags and cold baths, have been sparingly employed, many think, with advantage.

It would seem that our modern notions as to the pathology of pneumonia have helped us very little in the treatment of the disease. In 1840, when pneumonia was looked upon as a simple inflammatory affection, Craigie laid down its treatment as follows: (1) An initial purge and free venesection, both sometimes, the latter generally, repeated; (2) tartar emetic in vascular sedative and diaphoretic doses; (3) diluent drinks and diuretics (chiefly nitre) to keep the kidneys active; (4) blisters to the chest, generally as the fever began to subside. The bowels were kept rather loose and the air of the room constantly cool. This treatment resulted in a hospital mortality of about twenty-five per cent., while, fifty years later, the disease being classed as infectious, the mortality is ten per cent. higher.

In our flight after microbes may we not overlook some very essential but homely details of treatment? Our knowledge does not enable us to kill the pathogenic germs, hence our treatment should be in the direction of oxidizing and eliminating the poison they generate, relieving the mechanical disturbance created by consolidation, and supporting the patient until the toxic storm has passed. The latter necessity has long been met by the administration of nutritious liquid food and alcohol The importance of intensifying oxidation by cold fresh air, by oxygen, and by local cold applications and cold bathing, is daily being more appreciated, while the re-establish-

[1] "The Mortality of Acute Lobar Pneumonia." Tr. Am. Climatological Assn., 1889.

ment of secretion and elimination by skin, kidneys, and bowels, principally the two latter, is hardly less important and is brought about partly by the cold and partly by salin diuretics and cathartics.

The mechanical disturbance produced by intense pulmonary congestion and consolidation has been much neglected of late years. I advance the suggestion that obstruction of the pulmonary circulation and consequent embarrassment, weakening and dilatation of the right heart and backing up of venous blood is not caused by, nor commensurate with, pulmonary consolidation. Theoretically, we expect speedier cardiac embarrassment where large areas are hepatized; practically, it would seem as though the intense and general pulmonary congestion often present, and sometimes occurring with an insignificant amount of solidification, offered sufficient resistance to the pulmonary circulation to explain all symptoms dependent thereon. Explain its cause in any way we please, we know that, sooner or later, in all bad cases of pneumonia, the right heart never empties, venous distension occurs, the whole heart begins to fail from dilatation and want of oxygen, the pulmonary congestion is intensified and pulmonary edema ends the scene.

For averting or relieving this mechanical condition, depletion is the only rational procedure, and, when weighing the claims of depleting agents, there is found only one possessing the advantages of simplicity, safety, speed, and efficacy, and that is the sudden abstraction of a variable but considerable amount of venous blood. Diaphoresis is insufficient, diuresis too slow and uncertain, safe catharsis too slow, speedy, effective catharsis too dangerous. Judicious venesection has none of these drawbacks and is only kept from its deserved sphere of usefulness by a mouldy tradition of ancient immoderation.

The teachings of nature should never be ignored, and for that reason I append brief notes of two hitherto unpublished cases of pneumonia in which spontaneous hemorrhage, followed as it was by speedy improvement, seemed conservative if not curative.

The first case was observed in 1892 by Dr. Jennie M. Richardson of New York, who kindly allows me to report it.

The patient was a rachitic girl of five years. On January 18th she complained of headache and pain in the right side. She had anorexia, fever, and a severe cough. Two days later she coughed up considerable red, frothy blood, and experienced marked relief. Blood-stained sputum persisted for several days. When first seen on January 23d she had all the outward indications and physical signs of croupous pneumonia. Her temperature was 39.3° C. (102.8° F.), pulse 140, respiration 52. During the morning of January 24th she complained of a pain in her side, and at 1.30 P.M., after a fit of coughing, there was another hemoptysis of about 30 c.cm. (℥ i) of red, frothy blood. Relief from the pain followed the hemorrhage, but the child remained feverish, restless, and wakeful. January 25th there was improvement in all symptoms, the temperature being 38.3° C. (101° F.), pulse 132, and respiration 33. The next day convalescence was assured.

The second case was seen in 1894 by Dr. Miriam T. Runyon of New York, by whose permission it is here reported.

The patient was a previously healthy girl of seven years. At 10.30 A.M. on the fourth day of a typical pneumonia, the child had a temperature of 39.4° C. (103° F.), pulse of 128, and respiration of 48. At 12.30 P.M. she had a severe nose bleed lasting nearly two hours. The mother saved 270 c.cm. (℥ ix) of blood. Immediate improvement and relief from pain followed. At 4 P.M. the temperature was 36.7° C. (98.2° F.), pulse 100, and respiration 28. Uninterrupted and rapid recovery supervened.

It is unnecessary to say that both these cases were very intelligently treated, the latter by calomel, diuretics, and external cold, but neither showed marked improvement until local congestion was relieved by sudden depletion. In another case, reported by Dr. D. A. Staunton[1] of Lexington, N. C., a profuse hemorrhage from the bowels was followed by very striking but not so immediate improvement.

If we see spontaneous hemorrhage, provoked by irrepressible congestion, so beneficial, why should we hesitate to resort to a timely employment of so harmless and potent a remedy? Why, indeed, unless we are slaves to fashion, even in medicine and incapable of throwing off a blind, unjust prejudice!

## DISEASES OF THE FRONTAL SINUSES AND THEIR TREATMENT.

By FRANK WISTER THOMAS, M.D.,
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In considering diseases of the frontal sinuses it is necessary to recall the anatomical relations of the parts in order to appreciate the symptoms presented. The sinuses may be described as two irregular triangular pyramids, each having an orbital plate of the frontal bone as a floor, two of the sides of each being formed by the inner and outer plates of the frontal bone, and the remaining side of each being formed by the septum, which is so frequently perforated as to render the sinuses pathologically one cavity. This region is lined by mucous membrane which is continuous on each side through small openings or infundibula with the mucous membrane of the nasal chamber. In some subjects foramina offer communication with the ethmoidal sinuses. Apart from those due strictly to traumatic causes, all diseases of

[1] *North Carolina Med. Jour.*, March, 1889.

this locality originate in the nasal membrane and present such modifications of the various catarrhal processes as are consistent with the nearly closed condition of the chambers. They may be classified as acute and chronic catarrhal inflammation, mucocele, and abscess or empyema, in addition to which we have such extraordinary conditions as are produced by foreign bodies, as the entrance of insects, or the lacerations and punctures due to wounds.

Acute catarrh of the frontal sinuses is present in a minor degree in nearly all cases of acute coryza in the adult, but retention diseases, as mucocele and empyema, are exceedingly rare. Dr. B. Alexander Randall of Philadelphia reports that in a practice of over 1200 cases yearly, requiring nasal examinations, he has not met with one case of empyema that was strictly his own case; and of 2237 nose and throat cases reported last year from the Brooklyn Hospital only three cases of catarrh of the frontal sinuses are mentioned. As hospital statistics necessarily contain a larger proportion of exceptional cases than is to be found in private practice, I addressed communications to a number of gentlemen engaged in nasal practice, in this and other cities, and from all I have received assurances of the extreme rarity of the conditions under consideration.

The symptoms of catarrh of the frontal sinuses are those of ordinary acute coryza plus frontal and supra-orbital headache of a boring and persistent character, increased by movements or by mental effort or by the use of alcohol, and occasionally accompanied by nausea and vomiting. Pressure at the internal angle of the supra-orbital ridge usually occasions intense and severe pain. When the inflammation becomes chronic and the mucous is retained, the condition known as mucocele exists. It may be produced by any cause which obstructs the infundibulum, and while usually unilateral, may affect both sides. Sometimes the distension is so great that crepitation may be heard and felt upon pressure over the affected region. In rare instances, also, a soft fluctuating tumor forms at the inner angle of the orbit. One gentleman, with a large hospital and private practice, informs me that he has only seen one such case.

Abscess, or empyema of the frontal sinuses, is only to be differentiated from mucocele by the greater severity of the general symptoms, by the creepings or positive chill of the pyemic state, and by the purulent rather than the mucous discharge from the nostril. When the obstruction of the infundibulum is complete we may have either the internal subsuperciliary tumor, before mentioned, or, from backward pressure, brain symptoms, which may terminate in a purulent meningitis. There is one symptom which has been observed by Dr. James Darrach, as occurring in at least two cases, which came under his observation, the significance and constancy of which, are uncertain. This consists of an intermittent feeling of falling, hardly a vertigo, but rather a sensation of pitching forward, with loss of muscular coördination. In one of the cases reported, the condition was somewhat relieved by blowing the nostril, and completely disappeared after the discharge of a large quantity of pus through the nasal outlet. So marked was the symptom that the doctor was summoned by the patient, not to attend a nasal, but what was regarded as a brain, condition.

Answers to communications addressed to a number of specialists concerning this symptom elicited little that is satisfactory, only two of my correspondents having noticed the symptom in any degree. One speaks of having observed a slight dizziness, and another noticed vertigo in one case of specific origin. As to the reflex or anatomical cause of this condition, clinical observation will probably clear up the question if its frequency and constancy are ever studied. While at first inclined to look on the cause as due to a disturbance of the cerebral circulation, the answers from my correspondents lead rather to the view of a reflex origin, for the reason that cerebral circulatory disturbance must be present in all cases of mucocele or empyema; and yet from numbers of cases reported I can find only the four cases of vertigo mentioned, one physician reporting three cases of unassociated empyema, and two cases associated with disease of the ethmoidal cells, but even in the latter cases no symptoms of vertigo were observed. These facts, taken into consideration with the established observation that peripheral irritation of the trigeminus at times produces "nasal vertigo," would point to the reflex origin of the symptom in the disease under consideration.

As regards treatment little can be said except that the nasal chambers must be kept free and clear by means of various alkalin sprays and astringent applications to allay local irritation; but in this connection I think that the constitutional or general circulatory state is being lost sight of in our enthusiasm for local treatment. There are two drugs which were much used by our forefathers, and are still used by homeopaths that will frequently modify the severity and duration of the disease. They are aconite and belladonna. For some years I have been in the habit of prescribing drop doses of each of these drugs every hour or two, in the earlier stages of catarrhal affections, and have met with most favorable results. During the *grippe* epidemic of 1890 I had the opportunity of comparing the results of this treatment with that by salol and phenacetin, and found that, although

less theatrical as regards the cessation of pain, they were more permanent and pleasanter in the relief of the catarrhal symptoms. Attention to the bowels is another important point, and the selection of the purgative is of equal importance. Too much scientific reasoning has obscured scientific observation in many cases, and the books give general directions to "move the bowels," but clinical observation will see better and speedier results from the administration of divided doses of either blue mass or calomel frequently repeated until the liver is slightly stimulated, than can be obtained from the use of salin or vegetable cathartics *ad nauseam*. Having been instructed to fear and dread the cumulative effects of drugs, and particularly the depressant effect of aconite, I exercise the precaution in patients of advanced age or in those having a feeble heart of prescribing at the same time large doses of strychnin, but I have practically never seen anything like depression follow small doses of aconite given in an acute catarrhal state, whereas I have seen cyanosis follow the administration of several of the antipyretics.

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## THE PHYSIOLOGICAL ACTION AND THERAPEUTIC USES OF YEAST NUCLEINIC ACID, WITH SPECIAL REFERENCE TO ITS EMPLOYMENT IN TUBERCULOSIS.

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(Continued from page 264.)

### TUBERCULOSIS.

THE principal object in writing this paper is to continue the record of my experience in the treatment of tuberculosis with yeast nucleinic acid. Before taking up the report of cases I wish to make some inquiry concerning the curability of tuberculosis.

The incorrect ideas of Virchow concerning the pathology of tuberculosis, and the equally erroneous clinical teaching of Niemeyer concerning the malignancy of this disease, have been so deeply impressed upon the profession that, although more than thirty years have passed since Villemin laid the foundations of correct knowledge by the discovery of the transmissibility of the disease from man to animal, and from animal to animal by inoculation, the shadow of the older teaching still falls upon us. If I may be permitted to modify and condense one of Cohnheim's statements on this point I should say: It happened fortunately that at the very time when Virchow was proclaiming the perfection of his teaching concerning the pathology of tuberculosis a discovery which was destined to prove his teaching erroneous was made in France.

Virchow attempted to make a sharp distinction between true tuberculosis and those processes in which caseation is, according to his teaching, due to inflammatory and hyperplastic processes. He taught that caseous pneumonia and scrofulous glands were not tubercular. The result of this teaching was that tuberculosis came to be regarded as a progressive process in which small malignant growths were formed, and which only exceptionally terminated otherwise than in death. Niemeyer founded his clinical teaching upon this pathology, and in doing so he employed statements more forcible in diction than true in fact, and these statements have not lost their influence upon the profession, although science has demonstrated their falsity. "The end of tuberculosis, as a rule, is death," is a statement which today largely determines the attitude of the medical profession towards the disease. "The greatest misfortune that can happen to one with phthisis is that he should become tubercular" is still practically repeated in much that is said about a "pretubercular" condition. The discovery of Villemin enabled investigators to demonstrate that the active virus in scrofulous glands, in granulation disease of the joints, in caries of the bones, and in caseous pneumonia is one and the same thing, and that susceptible animals inoculated with matter from any of these sources become tuberculous. With this evidence before him the pathologist repeated his studies from a vantage point and the researches of Schüppel, Buhl, Ziegler, Senftleben, Cohnheim, Baumgarten, Köster, Friedlander, and others in Germany, and of Ranvier, Cornil, Grancher, Charcot, Lépine, Thaon, and others in France, completely demolished the pathology of tuberculosis as taught by Virchow and demonstrated the existence of tubercular lesions in parts of the body once supposed to be free from such invasion, such as the conjunctiva, the cornea, the choroid, the iris, the skin, the muscles, the bones, and the blood vessels. Finally, the discovery by Koch of the specific cause of tuberculosis has given positive proof of the etiological unity of its various manifestations.

The erroneous teachings of Virchow as to the pathology of tuberculosis have lost their force for all except the few who professionally live in the distant past; but the clinical teaching founded upon this false pathology, and as especially exemplified in the writings of Niemeyer, is still a controlling factor in our treatment of this disease. We have been too slow to perceive that our advanced knowledge of the etiology and pathology of this disease has given us just cause for a more hopeful attitude toward it.

In 1882, Baumgarten[1] wrote in sum and substance as follows: "Tuberculosis is in and of itself not so bad a disease. We do not believe that it possesses, as a constant property, 'the considerable local malignancy' which Friedländer believes he must still unconditionally attribute to it. When we see individuals who as children had thickened, tuberculous cervical glands or tuberculous disease of the joints develop into the strongest and handsomest men; when we see people who in childhood had Pott's disease, which is always due to tuberculous caries of the vertebræ, live for years with this deformity, and reach advanced age; with such observations as these so frequently before us, we must conclude that tuberculosis is not so deadly as is usually supposed." . . . "The curability of phthisis pulmonalis was well known to the older pathologists. The distinguished Carswell wrote: 'In no other disease has pathological anatomy furnished more positive evidence of curability than it has for tuberculous disease of the lungs.' Under the dualistic theory, when a case recovered it was said to be one of simple inflammatory nature, and not tuberculous. However, since we know that caseous phthisis is tubercular, we must admit that tuberculosis is curable. The tendency to heal is much more evident in the 'true tuberculosis' of Virchow than it is in his caseous pneumonia. We will, therefore, come much nearer the truth if we take the oft-quoted saying of Niemeyer, 'The greatest misfortune which can happen to one with phthisis is that he should become tubercular,' and make it read as follows: 'The greatest misfortune which can happen to one with pulmonary tuberculosis is that he should become phthisical.'"

Tuberculosis, so long as it remains an unmixed infection, is not a deadly disease, and I believe it to be, in this stage, one of the most easily curable of the bacterial diseases. Except in the forms of acute miliary and meningeal tuberculosis, it is but seldom the direct cause of death. However, as soon as it becomes a mixed infection, and is something more than tuberculosis, it then takes rank as the most fatal of all the diseases now afflicting mankind. In combating this disease, there are two points of attack, and if the wisdom and skill of the profession be directed to these, the death rate from tuberculosis will be much reduced in the near future. The first and most important method of dealing with this disease consists of the application of preventive measures. With these, however, I have at this time nothing to do. The second, the one with which I am now concerned, consists of the treatment of the disease while it remains an unmixed infection. When this is done, tuberculosis will cease to be "the terror of the laity and the cross of the physician." In order to accomplish this work, however, we must put aside certain dogmas, which we have so long mistaken for facts that their shadows frighten us. We must be convinced that as an unmixed infection it is curable. We must be able to recognize the disease while it remains an unmixed infection. We must cease regarding certain conditions as evidence of the existence of an indefinite, imaginary, so-called "pretubercular" state, and must learn to look upon these conditions as proof of the actual existence of tuberculosis. I will now give attention to these points, and in so doing I will consider them quite apart from the claims which I may make for nuclein or any other agent employed for curative purposes.

Is tuberculosis a curable disease? If so, to what extent is it curable? What shall we understand by "the curability of tuberculosis"? Are tubercular deposits ever absorbed? Do such deposits ever wholly disappear and leave no trace of their former existence? May tissues once invaded by the bacillus tuberculosis regain histological continuity? Is there ever a *restitutio ad integrum*?

One-seventh of all men die of tuberculosis and one-third of all men have the disease. The first part of the preceding statement is shown to be true by the mortality statistics of all civilized countries. The second part of the same statement is shown to be true by the records of autopsies in various parts of the world. Massini[2] found evidence of tuberculosis as shown by scars, indurations, cheesy and chalky foci in eighty-nine out of 228 autopsies made upon persons who had died of diseases other than tuberculosis at the Basle Hospital. Müller[3] found in the Munich Pathological Institute that tuberculosis caused 29.4 per cent. of deaths in adults, and 30 per cent. in children, and that 11.8 per cent. more of the children had tuberculosis. Bollinger's[5] researches confirm these statements. Baumgarten[4] states that from one-fourth to one-third of all the bodies sectioned show tubercular lesions. Queyrat[6] found tuberculosis in 31.4 per cent. of the children examined. Lundonzy[8] reports that 30.4 per cent. of the children brought to autopsy are tuberculous. Babes[7] found tubercular deposits in one-half the children dying from all diseases at Bucharest. In 1887 he sectioned

[1] *Ueber latente Tuberculose*, Volkmann's "Vorträge," No. 218.

[1] As quoted by Hahn, "Ein Beitrag zu den Fieberverhältnissen bei der Phthise," S. 10.

[2] "Zur Kentnis der Kindertuberkulose." *Münchener Med. Wochenschrift*, 1889.

[3] "Ueber Entstehung und Heilbarkeit der Tuberkulose." *Münch. Med. Wochenschrift*, 1890.

[4] "Ueber latente Tuberkulose," Volkmann's "Beiträge," No. 218.

[5] "Sur la tuberculose infantile," *Progrès Médical*, 1896, p. 333.

[6] "De la frequence de la tuberculose au premier age." *Revue de Médicine*, 1887, p. 383.

[7] "Recherches sur les associations bacteriennes du bacilli de la tuberculose," *Progrès Méd. Roumain*, 1888.

ninty-three children, sixty-five of whom had tubercular glands. Haitnel[1] claims that one-third of the children examined at *L'hospice des Enfants assistés* show tubercular lesions. Simmonds, Schwer, and Boltz[2] state that autopsies at the Anatomical Institute at Kiel of 781 children, aged from one to five years, showed tubercular lesions in 230; of 228 between five and ten years, 78 were tubercular; of 162 between ten and fifteen years, 56. Wolff[3] states that autopsy reveals either recent or old tubercular lesions in from forty to fifty per cent. of adults and in from sixty to seventy per cent. of children; also that thirty per cent. of adults and forty per cent. of children have latent tuberculosis. Schlenker[4] found in 100 consecutive autopsies at Zurich 66 bodies tubercular; 35 of these had died of tuberculosis; in 4 others the disease was marked, but had not caused death; while in 27 it was latent and had not been suspected during life. In this examination no lesion was pronounced tubercular unless it was evident and characteristic to the unaided eye. He points out the fact that had the indurations been examined microscopically, the percentage of cases of latent tuberculosis would have been increased. According to Adossides[5] of 4815 bodies sectioned at Halle from 1882 to the middle of 1893, 1066 showed gross tubercular lesions.

These and other statistics of like import justify the assertion that about one-third of all men are, at some period of life, infected with tuberculosis. Now, if one-third be infected and one-seventh die of the disease, it must be that the difference between one-third and one-seventh, a little more than one-fifth, are tubercular but do not die of this disease. Of the sixty-three millions of people living in the United States in 1890, nine millions have died or will die of tuberculosis, while twenty-one millions have been, are, or will be infected with the bacillus tuberculosis. Does this not demonstrate that tuberculosis does not possess the malignancy attributed to it?

The fact that one may be infected with tuberculosis and such infection remain localized for many years is shown by the study of cases of lupus. Out of 27 cases of lupus studied by Doutrelepont[6] the infection spread and the patient died of tubercular meningitis in only one instance. Hasland found 6 cases of what he regarded as metastatic involvement of the internal organs in 53 cases of lupus, and Holm[1] observed 11 in 62.

The study of instances of accidental inoculation with the bacillus of tuberculosis in wounds, sometimes known as cadaver (Leichen) tuberculosis tends to similar results. It is true that the infection in these cases may extend to the internal organs, but often the disease remains a local infection and not infrequently a spontaneous cure occurs.

Verneuil[3] reports the case of an assistant who became inoculated at the root of a finger-nail while sectioning a tubercular body. Four or five days later a small point of suppuration appeared. Three years later the finger was amputated at the second phalanx and at the same time a tubercular abscess on the back of the hand was opened. Three years later still a bruise of the stump of the finger was followed by tubercular sequestration. Up to this time the internal organs had remained sound and subsequently the man died of spinal meningitis. Karg[8] reports the case of a physician who developed a wound tubercle on the thumb. For six years this remained without any signs of extension. Then the thumb became swollen and red and several tubercular abscesses developed along the lymphatics. These were opened and the bacillus found in the contents. Riehl[4] states that Dr. Karg inoculated himself in an interdigital fold. Two small tubercles were removed and found to contain bacilli. Kraske[5] observed a boy, who, after a surgical operation became infected from his tuberculous sister. The tuberculous growth was removed and the boy remained well. According to Tscherning[6] a servant inoculated her finger with the broken cuspidor of her tuberculous master. The tubercle at the point of inoculation and some swollen axillary glands were removed and in these the bacilli were found. The servant remained in good health. Lehmann[7] observed ten Jewish children with local tuberculosis after circumcision by a tuberculous rabbi. Three died of marasmus, three of tubercular meningitis, one of intercurrent diphtheria, and three recovered. Many other cases of wound tuberculosis have been reported and a valuable review of the subject has been written by Schmidt.[8] The study of these cases shows that inoculation with the bacillus tuberculosis does not always cause death, and that

[1] "La tuberculose héréditaire et la tuberculose du premier age."
[2] Quoted by Gartner. "Ueber die Erblichkeit der Tuberkulose." Zietschrift für Hygiene. B. 13, S. 132.
[3] *Deutsche Med. Wochenschrift*, 1892.
[4] "Beitäge zur Lehre von menschlichen Tuberculose." Berlin, 1893.
[5] "Ueber den heutigen Stand der Therapie der Peritonis tuberculose." Halle, 1893.
[6] "Meningitis tuberculosa nach Lupus," *Deutsche Med. Wochenschrift*, 1886.

[1] Quoted by Schmidt, "Ein Fall von lokaler Impf-Tuberkulose der Haut."
[2] *Simaine Médicale*, 1885.
[3] "Tuberkelbacillen in einem sogenanten Leichentuberkel." *Centralblatt für Chirurgie*, B. 12.
[4] "Tuberkelbacillen in Leichentuberkel." *Centralblatt für Chirurgie*, B. 12.
[5] "Ueber tuberkulose Erkrankung von Wunden." *Ibid.*
[6] "Inokulationtuberkulose beim Menschen," *Fortschritte der Medicin*, 1886.
[7] "Ueber einen Modus der Impftuberkulose," *Deutsche Med. Wochenschrift*, 1886.
[8] "Ein Fall von lokaler Tuberkulose der Haut."

man is much less susceptible to the disease, when thus acquired, than are rabbits and guinea-pigs.

Further evidence that one infected with tuberculosis may recover from the disease is furnished in the observation of other forms of local tuberculosis. Tuberculous joints often heal, and the child afflicted in this way may develop into the most robust adult. König[1] says that coxitis may heal at any stage of the disease. Tubercular abscesses may disappear and leave scar tissue as the only evidence of their existence. Tubercular orchitis and tubercular pericarditis have been known to disappear. These evidences of the possibility of the healing of tissue once invaded with tubercles should encourage us, because in all cases tuberculosis begins as a local disease, and the tissue at first involved is only of microscopic extent. The germ is inhaled, and finds lodgment, and begins to multiply somewhere in the lung. The sooner the inoculation is recognized the greater are the chances of so improving the resistance of the tissue that extension of the infecting agent does not occur, and then it dies out or remains localized. I have stated that every case of tuberculosis begins as a local disease. The researches of Buhl and others have shown that this is true even in acute miliary tuberculosis and in tubercular meningitis. In these the systemic infection comes from a pre-existing tubercular focus. Friedlander[2] and others have described quite thoroughly the changes which take place in the spontaneous healing of local tuberculosis.

The evidence that tuberculosis of the peritoneum occasionally undergoes a spontaneous cure and frequently heals after laparotomy is no longer questionable.

Since the publication of the now classical paper by König[3] in 1884, on laparotomy in peritoneal tuberculosis, surgeons in every part of the world have resorted to this operation as a curative agent, with a fair degree of success. These cases have been collected and the results summed up by Phillips,[4] Lauser,[5] and others.

Adossides[6] has tabulated 405 laparotomies for tubercular peritonitis with thirteen per cent. of cures, counting as cured all those who lived two years or longer after operation.

It will be interesting to learn, so far as we are able, the histological changes involved in these cases of cure of tubercular peritonitis after operation. Is there a complete disappearance of the tubercles? Richelot[1] opened the abdominal cavity on account of strangulated hernia in a woman upon whom he had twice before performed laparotomy for tubercular peritonitis. The last operation for tuberculosis had been made one year before that for the hernia. He found the peritoneum perfectly smooth, of normal color, and free from adhesions. Knaggs[2] performed laparotomy for tuberculosis, and five and one-half years later operated on the same woman for hernia. At the second operation there was no trace of tuberculosis detectable, although at first the intestines, mesentery, and parietal peritoneum were thickly covered with tubercles. Clarke[3] reports a case in which an ovariotomy was made eighteen months after a laparotomy for tubercular peritonitis, and the second operation showed that the tubercles had wholly disappeared. Similar cases with similar findings have been reported by Schede, Winiwater, Ahlfeld, Hirschberg, Schmalfuss, Tait, Feldmann, Terillon, Esmarch and Werth (see monograph by Adossides).

These observations demonstrate not only that tubercular peritonitis may be cured by laparotomy, but that the cure may mean a complete *restitutio ad integrum*.

The following experiments bear upon this point: On December 31, 1895, we inoculated three full-grown rabbits intra-abdominally with a pure culture of the bacillus tuberculosis. No. 1 was employed as a control, and received no treatment of any kind. It died May 25, 1896. The peritoneum, omentum, liver, and spleen were tuberculous. There was also a large tubercular abscess in the abdominal wall at the point of inoculation.

No. 2 was placed in the holder January 25, 1896, and the abdominal cavity opened. In the wall at the place of inoculation there was a tubercular induration as large as a nickel. In the mesenteric fold of the colon there was a tubercle as large as a pin-head and many smaller ones. The omentum was filled with small nodules, and the border of the liver was dotted with pin-point tubercles. After noting these facts, the abdomen was closed and nothing more was done to this animal until July 24, 1896, when it was killed. What had been a tubercular induration in the wall was at the autopsy only a lump of yellow fat. No sign of tubercle could be found in it. The liver was perfectly sound. There were heavy deposits of fat of a deep yellow color in the omentum and mesentery, and in these the tubercles observed at the time of the laparotomy were found. These nodules had not increased in size, but they contained

[1] *Specialle Chirurgie*, B. 3, S. 445.
[2] "Ueber locale Tuberkulose," Volkmann's *Vorträge* No. 64.
[3] *Centralblatt für Chirurgie*, 1884.
[4] Die Resultate operation Behandlung der Bauchfell tuberkulose. *Gekrönte Preisschrift*, Göttingen, 1890.
[5] Ueber Tuberkulose-Peritonitis und ihre Behandlung durch Laparotomie. Regensburg, 1893.
[6] "Ueber den heutigen Stand der Therapie der Peritonitis tuberculosa," Halle, 1893.

[1] *Revue de Chirurgie*, 1893.
[2] *Lancet*, November 11, 1892.
[3] *Ibid.*

a caseous center in which tubercle bacilli, which stained normally, were found.

No. 3 had its abdominal cavity opened January 25, 1896. There was an induration in the wall at the point of inoculation similar in size and appearance to that observed in No. 2. The mesentery and omentum were filled with nodules the size of flaxseed and the border of the liver dotted with fine tubercles. One nodule was cut from the omentum and examined for bacilli, which were abundantly present. The abdomen was closed, and 45 c.c. of a one-half per cent. solution of nucleinic acid was injected into the jugular vein. Nothing further was done to this animal until July 24, 1896, when it was killed. Not the slightest evidence of tubercle could be found anywhere. The induration in the wall had wholly disappeared and the mesentery and omentum were perfectly smooth. The deposits of yellowish fat observed in No. 2 were not found.

The following details will show that the skin and muscles may also regain histological continuity after tubercular invasion. November 18, 1895, two rabbits, which may be designated as A and B, were inoculated intra-abdominally with tuberculous sputum. The weight of A was 1552 and that of B 1402 grams. On December 6, 1895, A died. There was a caseous infiltration extending for one and one-half inches longitudinally and one-fourth inch transversely under the skin of the abdomen. The muscles of the abdomen were infiltrated with a creamy, semi-solid exudate, in which the diplococcus pneumoniæ, in great numbers, and the bacillus tuberculosis, in small numbers, were found. There was some effusion in the peritoneal cavity, and in this also both the above-mentioned germs were present. Death was due to the septicemia induced by the diplococcus. At this time B showed a suppurating sore two inches in length and one-fourth inch broad on the abdomen, and a round ulcer three-fourths of an inch in diameter and extending deep into the muscles on the right thigh. Tubercle bacilli were repeatedly found in the pus from each of these sores. December 6, 1895, 50 c.c. of a one per cent. solution of nucleinic acid was injected into the jugular vein and the next day 15 c.c. more was injected into the vein of the ear. On December 7 B weighed 1394 grams, on December 14, 1480, and on December 21, 1592. On December 27, B was found to be losing in weight, falling to 1542 grams. At this time the sore on the abdomen had healed over, but a nodule had appeared at the point of inoculation and had grown to the size of a filbert. The sore on the hip was still discharging, although it had decreased very much in size. On December 27, 1895, B received hypodermically about the nodule on the abdomen 30 c.c. of the one per cent. solution, and two days later 40 c.c. more. After this B received no further treatment, but continued to grow fat and strong. On July 23, 1896, B was killed; weight at that time was 2030 grams. There was some adhesion of the skin to the muscles over the abdomen where the sore had been, but nothing more. The hard nodules had wholly disappeared. All internal organs were in perfectly normal condition. The ulcer on the hip had wholly disappeared and there had been complete reconstruction of the injured tissues. There was not even a scar to mark the place of the former lesion.

I have brought forward these observations on the rabbits at this time not for the purpose of making any claims for nuclein, but in order to show that there may be a *restitutio ad integrum* in tissue after tubercular invasion. For my present purpose it matters not what be the nature of the agent that brings about the restitution.

Many theories have been advanced to explain the curative effect of laparotomy on tubercular peritonitis. It has been attributed to the influence of the light, which reaches the peritoneum during the operation (Lauenstein), to the entrance of air (Mosetig-Moorof), to mechanical irritation and the presence of air (Caspersohn), to the bacterium termo, which is supposed to enter the cavity with the air (Cantani), to a digestive action of the peritoneum, that is assumed to be called into action by ths operation (Sänger), to a suction action, "aufsaugende kraft" of the peritoneum, due to the relief of pressure (Fritsch), to the oxygen of the air (Braatz), to improved resorption (Lindner), to inflammatory adhesions (König, Breisky, Hartman, and Aldibert), to a connective tissue reaction (Phillips), to improved circulatory and respirating action, and to relief of the autointoxication (Vierordt), and to the use of disinfectants used in the operation and sometimes in washing out the cavity (Preindlsberger and Ceccherelli). However, the explanation suggested by Kischenski[1] that the cure is due to the leucocytosis which follows the operation is the most reasonable. Adossides accepts this explanation and sensibly adds that the action of the leucocytes is favored by (1) the relatively small number of bacilli present, and (2) the great extent of the peritoneal membrane and its great vascularity.

Tubercular peritonitis has been cured not only by surgical means, but under medicinal treatment also. Such cases have been reported by Bouilard, Vierordt, Anderson, Comby, Fagge, and others.

Cases of tubercular meningitis terminating in recovery have been reported, but from the nature of

[1] *Centralblatt für Chirurgie*, 1893.

the disease it is difficult to furnish positive evidence to this effect. However, such able diagnosticians as Rilliet and Trosseau have reported cures. I have carefully studied the monograph by Zwicke[1] on this subject, and must conclude that he does not supply convincing proof of the correctness of his diagnosis in the case of cure reported by himself.

The researches of Orth,[2] Fraenkel,[3] and Prognbinsky[4] have demonstrated that tuberculosis may be located primarily and exclusively in the larynx, and Schmidt[5] claims to have cured five cases of this disease by tracheotomy. He attributes the curative action to the rest given the larynx and to the more direct action of the oxygen of the air. Glöckner[6] has reported two cases treated by tracheotomy without benefit, but in both of these the lungs were extensively involved and the ulceration of the larynx was probably secondary; certainly the disease was not confined to the larynx. Krause[7] has claimed success in the treatment of laryngeal tuberculosis by his method, with lactic acid, and his observations have been confirmed by von Schroetter,[8] Keimer,[9] Heryny,[10] Jellinick,[11] and others. Like good results are claimed for iodoform by Beschorner,[12] Schultzer,[13] and others.

In regard to the cure of pulmonary tuberculosis, either spontaneously or under climatic or medicinal treatment, there is much information to be found in medical literature, but it can not be so positive as that given concerning peritoneal tuberculosis. If there be histological restoration there can be no evidence after death of the existence of the disease during life. Scars and chalky deposits are frequently observed, and the fact that these contain tubercle bacilli demonstrates the former existence of the disease in an active form. Carswell[14] states, as has already been quoted, "that pathological anatomy has probably not given such positive proof of the curability of any other disease as it has of phthisis." Weber[15] says: "It seems to me impossible for any one acquainted with the literature of the subject to doubt the curability of phthisis." Rühle[1] asserts that tuberculous processes in the lungs may heal.

Green[2] says: "It lies in the very nature of the case that there can be no absolute cure, no *restitutio ad integrum*, and the very best that can happen is the formation of a scar or of a chalky deposit."

"One frequently has the opportunity of seeing these healed foci in various stages; sometimes as scars, again as connective tissue nodules, or as cavities filled with chalky concretions. The size of these cavities varies from that of a hemp seed to that of a hazelnut. Generally the remainder of the lung is in a normal condition. These healed places are generally found in the apices, where tuberculosis most frequently begins. They lie near the surface; the apex is more or less contracted; the pleura pulmonalis is thickened and more or less adherent to the pleura costalis. To the finger these points feel like hard lumps. The interior of the nodule consists of a well encapsuled mass of variable consistency depending upon the length of continuance of the healing process. The center is hard, generally calcified, while the periphery is softer, incompletely calcified."

Green has examined a number of these healed cavities microscopically and in some the bacilli were detected, while in others the result was negative. Dejerine[3] has made a similar study with like results. He also inoculated guinea-pigs with the wholly calcified material and failed to induce tuberculosis. Kurlow[4] obtained the following results from his inoculations:

1. Using scar nodules in which no bacilli could be found; two inoculations; both negative.

2. Using completely calcified nodules in which no bacilli could be found; four inoculations; all negative.

3. With caseo-chalky nodules about which no tubercles could be found. In many of these nodules no bacilli could be detected; twelve inoculations; all the animals became tuberculous.

4. With caseo-chalky material about which tubercles were found; seven inoculations with positive results in all.

Nauwerk,[5] Demme,[6] and others, have given the clinical histories of cases of recovery from pulmonary tuberculosis with death from some other disease and the findings at autopsy.

[1] "Beitrag zur Heilung der Meningitis basilaris tuberculosa," Bonn, 1868.

[2] "Lehrbuch der Patholog. Anatomie."

[3] Primare Kehlhopftuberkulose. *Deutsche Med. Wochenschrift*, 1883, S. 490.

[4] *Medycyna*, 1887.

[5] *Deutsche Med. Wochenschrift*, 1885 and 1886.

[6] "Ein Beitrag zur Behandlung der Laryngo-Phthisis tuberculosa," 1890.

[7] "Milchsaure gegen Larynxtuberkulose," *Berlin Med. Wochenschrift*, 1885, and *Deutsche Med. Wochen.*, 1886.

[8] "Verlosungen über die Krankheiten des Kehlkopfe."

[9] "Ueber Kehlkopftuberculose, ihre Behandlung und Heilung." *Deutsche Med. Wochenschrift*, 1886.

[10] *Deutsche Med. Wochenschrift*, 1886.

[11] "Ueber Milchsaurebehandlung im Kehlkopf, Rachen und der Nasse, Centralblatt für die gesamte Therapie."

[12] "Die localer Behandlung der Laryngo-Phthiso-tuberculosa," Dresden, 1888.

[13] Ueber Diagnose und Heilbarkeit der Kehlkopfschwindsucht unter dem Einflusse des Iodoforms, *Wiener Med. Presse*, 1880.

[14] *Pathological Anatomy*, London, 1838.

[15] "Lectures on the Hygienic and Climatic Treatment of Chronic Pulmonary Phthisis" (German edition), Leipzig, 1888.

[1] Ziemssen's *Handbuch*.

[2] *Ueber Tuberkelbacillen in alten ausgeheilten Lungenherden*, Berlin, 1889.

[3] Recherche des bacilles dans la tuberculose calcifiée et caseo-calcifiée, *Revue de Médicine*, 1884.

[4] Ueber die Heilbarkeit der Lungentuberkulose, *Deutsches Archiv. für klin. Med.*, B. 44.

[5] "Ein Fall von geheilter Lungentuberkulose," *Deutsche Med. Wochenschrift*, 1883.

[6] "Jahresbericht über die Thatigkeit des Jennerschen Kinderhospital in Bern," 1884.

Wolff and Saugmann[1] have given us valuable information concerning the possible cure of pulmonary tuberculosis. In 1862 Brehmer began the treatment of tuberculosis in his hospital at Görbersdorf. In 1890 Wolff and Saugmann sought out many of the earlier cases treated by Brehmer, and reported upon their condition. The number found and studied was 142. In some of these the evidence of the previous existence of the disease and its arrest cannot be doubted. One of these is reported as follows: In 1876, a woman entered Brehmer's hospital with infiltration of the right lung to the third rib, and a less marked infiltration over the same area of the left lung. She had fever and night sweats, and was reduced in flesh. She remained in the institution thirteen months, and was dismissed "cured." Fourteen years later she was operated upon for myomata uteri and died. A few days before death her lungs were carefully examined, and the only evidence of disease that could be found was a slight prolongation of the expiratory sound over the upper right lung. Section showed a cicatricial contraction, with a circumference of about 4 cm. in the right apex; otherwise no abnormality could be found in the lungs and no tuberculosis in any part of the body. In microscopical sections of the scar tissue tubercle bacilli, which stained well, were found. The authors are certainly justified in the conclusion drawn from the case. Considering the severity of the case when it came under treatment, fourteen years before, the cure must be regarded as ideal, but, nevertheless, it was not absolute, because the bacilli remained and, as indicated by the tinctorial reaction, retained their vitality, and in this respect the patient showed a condition no more serious than that exhibited by "one-half, or at least one-third, the bodies that reach the autopsy table."

These authors conclude that at least eight per cent. of those treated at Görbersdorf from 1862 to 1891 were permanently cured.

I have gone into the question of the curability of tuberculosis thus specifically (and I might say that the evidence on each point might be confirmed more fully did space and time permit) because I believe that the present attitude of the profession in general toward this disease is radically wrong and harmful. I believe that I am right in saying that the average physician does not strive to recognize this disease as early as is possible, but that he wilfully disregards all evidence of its existence until, in the majority of instances, it is altogether too late. I shall have something to say concerning the means of an early diagnosis in another part of this paper.

[1] "Ueber Dauerende Heilung der Lungentuberkulose," Wiesbaden, 1891.

I will now proceed to state the results obtained in the treatment of tuberculosis with yeast nucleinic acid. In doing this I will make the reports of cases as short as is possible, and at the same time consistent with clearness. In order to avoid repetition, I may state here that in all of the seventy-five cases reported the tubercle bacilli were found; and in all of the urinary cases guinea-pigs were inoculated and tuberculosis developed, in order to be certain that I had not mistaken the smegma bacillus for that of tuberculosis. No case is reported in this list which first came under observation later than December, 1895.

(To be continued.)

## CLINICAL MEMORANDA.

### A CASE OF INTRAUTERINE HYDROCEPHALUS OF UNUSUAL SIZE; EVACUATION OF THE FLUID THROUGH THE SPINAL CANAL, FOLLOWED BY EASY DELIVERY OF THE HEAD.

BY IRA G. STONE, M.D.,
OF MEAD, NEB.

ON the morning of December 30, 1895, I was called in consultation to see a case of difficult labor. Arriving at 5.30 o'clock, I obtained the following history: Mrs. D., of Irish extraction, rather under medium size, with small bones, but pelvis of fair capacity. Two normal confinements preceded the present one. At this confinement she was taken in labor on the evening of December 29th, after a normal gestation, and at 2 o'clock on the morning of December 30th a breech delivery of the fetal body occurred, but the head could not be induced to descend. On examination, I found the fetus to be of rather small size, poorly nourished, and with contractions of both lower extremities (double talipes equino varus). The arms were delivered, but the shoulders remained well up in the lower vaginal tract, the right resting under the pubes and the left low down in the sacral concavity. In this condition the patient had remained from 2 to 5.30 o'clock, A.M. By making strong traction on the fetal body, I succeeded in stretching the neck sufficiently to bring the shoulders down so that an examination with the finger, though difficult, could be made up to the base of the skull. By withdrawing and reinserting the finger at various points, I finally succeeded in carrying the examination sufficiently far to satisfy myself that the retention was due to an enlargement of the fetal head.

On examining the surface of the abdomen of the patient, the uterus was found to extend about two inches above the umbilicus, and to be filled with a semi-solid substance, in which nothing definite could be outlined. Its contour was nearly round, and pressure at all points over the uterine surface yielded the same degree of resistance, with no well defined hard points or projections.

The necessity of relieving the woman at the earliest

possible moment was imperative, as the expulsive efforts on the part of the uterus had become very feeble, and her condition was that of extreme exhaustion. Of the several methods adopted for tapping the fluid contained in the head, I chose the one suggested by Van Huevel, and first performed by Tarnier in 1876—that is, by reaching the accumulated fluid by way of the spinal canal. My reasons for adopting this method were based on the following facts: (1) Owing to the large size of the fetal head, it could not be brought low enough in the pelvic cavity to be easily reached alongside the neck. (2) To reach the base of the skull between the vaginal walls and the side of the trunk and neck of the child, which crowded the vagina to its utmost capacity, would have been very difficult, to say the least. (3) The danger of wounding the maternal tissues with either a cutting or perforating instrument, and the subsequent possibility of the absorption of septic material, was to be considered as of no small consequence. (4) The absence of the proper instruments, which is so common to the practitioner in remote districts.

On the other hand, the advantages of tapping through the spinal canal, in this case at least, were: (1) The ease with which the fluid could be reached through this hollow tube, protected as it is on every side by the hard resisting walls formed by the vertebræ. (2) The absolute safety to the maternal tissues, they not coming in contact with cutting or perforating instruments. (3) The few and every-day instruments required to do the operation, and (4) because the operation could be performed directly under the supervision of the operator's eye.

After deciding, for the above reasons, to reach the fluid through the spinal canal, I proceeded as follows: Placing the woman in an easy position, with the fetal back well exposed and easily accessible, I made a transverse incision, about two inches long, across the spinal column of the child, as near the external parts of the mother as convenient. This incision was carried down between the spinous processes, and was located below the center of the scapula. Then an incision was made parallel with the spinal column, and of about the same length as the first, directly over the ends of the spinous processes, and carried downward. After making the incision, the flaps were turned back on each side down to the spinal column, and then the posterior segment of one of the dorsal vertebra was removed to facilitate the entrance of the catheter. Having with me only a soft rubber catheter, I found it too flexible to force its way through the canal, so withdrew it and placed the end of a uterine sound through its eye, and had no difficulty in passing it on into the fetal head, and as soon as the catheter entered the head a flow of almost transparent fluid occurred, and continued until sixty-four ounces had been drained off. About this time uterine contractions became stronger, and by moderate traction on the fetal trunk, aided by suprapubic pressure, the head was delivered, still containing a considerable quantity of fluid that had not passed off through the catheter. The fluid had a specific gravity of 1006 at the body temperature, and well-marked alkalin reaction. The placenta was delivered in due time, and the patient made an uneventful recovery.

In reporting this case, I have two objects in view. The first is to point out the advantage of entering the cranial cavity by the way of the spinal canal over that of tapping through some point at the base of the skull, gaining access thereto by way of the vagina. The second point which I wish to bring out does not necessarily belong in this report, yet I wish to present it, from the fact that the condition was present in this case, and, taken into consideration with other evidence, aided me in making a diagnosis of intrauterine hydrocephalus. The proposition is that congenital contractures of the extremities are due to an intrauterine irritation located somewhere in the cerebrospinal tract.

## A CASE OF EARLY CEREBRAL SYPHILIS.[1]

By DOUGLASS W. MONTGOMERY, M.D.,

OF SAN FRANCISCO, CAL.;
PROFESSOR OF DISEASES OF THE SKIN, MEDICAL DEPARTMENT OF THE UNIVERSITY OF CALIFORNIA.

THE idea used to be prevalent that the syphilitic virus first expends its energy on the skin and mucous membranes, and that the deep internal organs are not affected until far later in the course of the disease. This is notably not the case, however, as far as the brain is concerned, and now cerebral symptoms are among the well recognized phenomena of early secondary syphilis. The following case is illustrative of this proposition:

On November 24, 1891, Dr. Louis Bazet sent me a patient, twenty-two years of age, who had a discrete papular eruption with excoriated tops on the face and scalp, a lenticular papular rash on the lower limbs, tenderness and induration of the left epitrochlear lymphatic gland, and tenderness over the situation of the right, enlargement of the posterior cervical lymphatics, sore throat, tenderness on deep pressure over the sternum, and a sallow complexion. Dr. Bazet informed me that the patient had left the Eastern States the month before to come to San Francisco, and that a sore had developed on the foreskin during the journey, which the patient had repeatedly cauterized with nitrate of silver. He evidently belonged to that class, the *jeunesse argentée*, who know altogether too much about the use of nitrate of silver.

When he came under Dr. Bazet's care, about November 1, 1891, he was in a bad condition. The temperature had run up to 103° F., the sore on the foreskin necessitated circumcision, and several inflamed and suppurating buboes had to be enucleated from each groin. The unfortunate course of the disease up to this point may have been due to the irritation caused by the previously-mentioned repeated and insufficient self-inflicted cauterizations. There being no doubt that he was suffering from syphilis, a corrosive sublimate lotion was prescribed for the rash on the face and scalp, and protiodid of mercury pills were given internally.

I did not see the patient again until about nine months later, in September, 1892, when he called on me at Dr. Bazet's instance, complaining of severe pain in the occiput. The epitrochlear and posterior cervical glands were no longer demonstrable, and the rash had disappeared,

[1] Read before the San Francisco County Medical Society, December 8, 1896.

but the patient was anemic. The urine was alkalin, but otherwise normal. In the intervening time he had been undergoing treatment faithfully, but his habits with regard to being out at night, smoking cigarettes, etc., had remained irregular. He was working in a badly ventilated office, but not by any means too hard. The headache was ascribed to the anemia, and the anemia to the irregular habits, the confinement in the office, and possibly also to the mercurials which he had been taking. The cessation of specific treatment, the taking of the elixir of iron, quinin, and strychnin, and a holiday, were advised.

He went to Monterey, and complained bitterly while there of what he thought were piles, but which were afterward found to be condylomata. In a short time he returned to San Francisco, still suffering from severe headache. While walking under a hot sun he suddenly complained of an intense pain in the head, and, a few days afterward, after being again exposed, it was noticed that his face flushed in a peculiar way. On the afternoon of the following day he had a "fit," tonic and clonic, with biting of the tongue and loss of consciousness, and during its progress attempted to jump out of a window. When seen about an hour after the attack he was sitting on a sofa, dazed and restless. His heart was beating rapidly, his pupils were equal, there was no paralysis, and his tongue protruded straight. This was on October 5, 1892, a little over one year after the sore was acquired.

The important question now before us was whether we should consider the epileptic seizure as a symptom of syphilis, for, in this case it required energetic antisyphilitic treatment. Viewing it from the standpoint of epilepsy alone, it is doubtful if it would have been right to ascribe it to the specific disease. Idiopathic epilepsy commences early in life, and this man was only about twenty-three years of age. If it had occurred for the first time later in life the intrinsic evidence of the convulsion being a symptom of syphilis would have been much stronger. Fournier has said that when epilepsy first appears at from thirty to thirty-five and forty years of age, in the very large majority of cases it is syphilitic. Seligmüller places the age much younger, and asserts that when an epilepsy commences in an apparently healthy individual past twenty years of age it is decidedly indicative of the presence of constitutional syphilis. This point of the intrinsic value as a symptom of syphilis of an epilepsy that commences in adult life is not by any means settled, however, and Mendel has expressed himself as at any rate against any such extreme view as that of Seligmüller.[1]

Viewing the convulsion in the light of all the facts, however, we were fully justified in taking this to be an epilepsy due to syphilis. It is now well known that although well-marked cases of syphilis of the brain cannot be said to be of frequent occurrence, when one takes into account the vast number of people suffering from this disease, yet, when cerebral syphilis does occur, it comes on far more frequently in the early than in the late course of the disease. Lang recently quoted a list of 168 cases of cerebral syphilis collected by Charles Mauriac, of which seventy-two, or 42 6–7 per cent. began during the first two years of the disease.[1] Furthermore, cerebral syphilis frequently first manifests itself by a prolonged and severe headache, followed by an epileptic seizure. We, therefore, had a young man in the early secondary stage of syphilis, with condylomata of the anus, suffering for the first time in his life from an epileptic fit, which had been preceded by a severe prolonged headache. The predisposition to this manifestation of syphilis brought on by the patient's habits ought also to be taken into account here, for the localization of the disease in the nervous centers, and especially in the brain, occurs chiefly in two classes of individuals—those who are fagged by mental work and worry, and those who are jaded with pleasure,[2] and he belonged to the latter class.

The evidence, therefore, was overwhelmingly in favor of the affection being syphilitic, with very few chances that it was not. He was immediately put on inunctions of mercurial ointment, and iodid of potash was administered internally. There was constant pain and tenderness of the crown of the head after the epileptic seizure, and this and the condylomata around the anus were the only symptoms the patient complained of. He was drowsy and taciturn, and his face had a mask-like appearance. He soon developed a decided fetor of the breath from the mercury, although every precaution was taken to keep his mouth clean. The inunctions were then stopped, the iodid of potash was increased up to forty-five grains a day, and Zittmann's decoction and cascara sagrada were also given to combat an obstinate constipation, which had come on after the epileptic attack, and which lasted till the severer nervous symptoms disappeared.

From November 3d to November 7th he had a slight rise of temperature of from a degree to a degree and a half every afternoon. Also, about this time, a paresis of the right side of the face, and then of the right upper and lower extremities, developed, but so slowly as to make it impossible to exactly fix the date of its supervention. No loss of sensation of any kind, either of pain, touch, temperature, or locality could be made out, but these observations were not exact, because of the patient's still stupid condition. He had no ataxia nor loss of patellar tendon reflex. He could not whistle, but he could always pronounce the labials well. He became decidedly aphasic, and very irritable when he could not remember names. He also became hypersensitive to both light and sound, and the barking of a neighbor's dog bothered him a great deal. The photophobia and the irritability of the auditory nerves seemed to be bilateral. These were the only ocular or auditory symptoms observed. About the middle of November, under the continued use of iodid of potash, 180 grains a day, he became much brighter, and the irritability to light and sound became noticeably less. The paresis of the right side of the face and of the right arm still continued, and the right thumb lay in the palm of the hand. One night toward the end of the month he

[1] *Deut. Med. Wochensch*, November 9, 1893.

[1] *Vorlesungen über Pathologie und Therapie der Syphilis*, von Prof. Dr. Edward Lang, p. 518.

[2] Fournier, *Traitement de la Syphilis*, p. 99.

wetted the bed, but we were inclined to consider this an accident rather than a symptom. During the next few weeks he improved steadily, both in regard to the paresis and the general symptoms, and about January 1, 1892, he felt well enough to take a trip to the southern part of the State. He still continued the iodid of potash in full doses, however, up to the middle of January. He then gave up taking medicine, and resumed the use of cigarettes, coffee, etc.

The fact that the brain symptoms began first with prolonged headache, followed by an epileptic attack and a subsequent hemiplegia, and that the onset of this hemiplegia was so insidious that the date of it could not be determined, and also that the paralysis, although distinct, was not at all profound, as well as the great variety of the nervous symptoms all corresponded with what is known to take place in syphilis of the brain. In all probability it was a syphilitic endarteritis of the left Sylvian artery, which narrowed the caliber of the blood vessel so that it did not carry sufficient blood to the left motor area. At first it gave rise to a headache from irregularity of circulation in the meninges, then epilepsy, and finally paresis throughout its wide area of distribution. It did not give rise to complete blocking and thrombosis of the vessel.

When the patient came back to San Francisco, after being away a month, he walked with a firm step, talked with precision and with his usual speed, and could write well. He went back to business immediately, but found he could not add figures as quickly as before; this was the only difficulty under which he labored. In a few days he called on me again, complaining of a severe "cold," and of muscular rheumatism in the right shoulder. Exactly two weeks after his return he was again confined to bed, suffering from coarse and fine tremors of both upper and lower extremities, and of the tongue. The most marked tremors were those of the hands. At first he was not able to write at all; two days later he could do so, but badly. The right arm was still not as strong as the left, and he said that it had never fully recovered from the first attack. He could not detect any difference in strength between his lower extremities. It was difficult to say if the face had returned to the normal as regards the paresis. We thought it had, for a drawing of the mouth to the left when he laughed was probably an inherited facial peculiarity and not a symptom. The sensations and reflexes were normal. His mind appeared to be clear, and his speech, except for some slight thickness in articulation, was normal. He said he had caught cold from sitting with his back to an open window. These tremors were not from mercury, as he had not been taking that drug for a long time. He was again put on iodid of potash, and went south, stopping a short time for treatment at Arkansas Hot Springs, and from there returned to the East.

I again saw the patient for a few minutes on the street on May 23, 1894, that is, over nineteen months after the epileptic attack. He had not done any work since his last illness, but had quietly settled down on the mother lode, and appeared to be working his claim quite successfully. He had just returned from the Eastern States, and was on his way to buy his ticket back again. He shortly afterward went to Paris for no known reason. This aimless wandering is a noticeable feature in some cerebral affections attributed to syphilis, and may have been a symptom of continued irritability of the brain in this case.[1]

The patient was married December 5, 1895, and his wife had a spontaneous miscarriage in May, 1896, at the second month of pregnancy. This was a very suspicious circumstance, in view of the fact that miscarriage is such a well recognized symptom of syphilis. It will be noticed that this miscarriage took place four and one-half years after the appearance of the man's primary lesion, and that during that time he had undergone a rigorous and prolonged course of treatment under Dr. Bazet and myself, another at Arkansas Hot Springs, where they have the reputation of not sparing medicine, and still another under a well-known specialist at the East.

## HOSPITAL REPORT.

### RESULTS OF FIVE MONTHS' TREATMENT OF DIPHTHERIA WITH ANTITOXIN AT THE NEW YORK FOUNDLING ASYLUM.

By J. LEWIS SMITH, M.D.,
of New York;
Visiting Physician to the Asylum.

The New York Foundling Asylum furnishes unusual facilities for observing diphtheria and the effect of its treatment. The number of infants cared for is necessarily much larger than can be accommodated in the wards, and a considerable number are therefore farmed out in tenement houses, and if they are taken sick are returned to the asylum.

The present house physician, Dr. J. D. Voorhees, has furnished the following table, showing the number of cases of diphtheria, and of deaths therefrom, occurring in the asylum during each of the seven years ending with December 1st:

| Years. | 1890 | 1891 | 1892 | 1893 | 1894 | 1895 | 1896 |
|---|---|---|---|---|---|---|---|
| Cases. | 71 | 67 | 60 | 123 | 133 | 94 | 147 |
| Deaths. | 36 | 35 | 23 | 34 | 32 | 43 | 18 |

During the five months ending December 1, 1896, the effect of the antitoxin treatment was carefully observed by the visiting physicians and house staff, with such attention to details as would be likely to increase the efficacy of the serum therapy. It was soon found that the injurious or negative results of the antitoxin treatment in the asylum during the first year of its use had been due to causes which might be avoided. The serum first used was prepared by a French company, in much too brief a period and without the proper testing, and of course proved unsatisfactory. The serum obtained from the New York Board of Health was found to be pure, efficacious, and in every way satisfactory. It is now used in the asylum to the exclusion of all other serums, and those who have witnessed its effects have often been

[1] See instances of aimless wandering in general paralysis of the insane given by Ch. Berger, *Arch. clin. de Bordeaux*, IV. 1, p. 25; 1895.

astonished, that a disease ordinarily so fatal, and the initial symptoms of which appeared often to indicate a severe type of the malady, became so mild in twenty-four hours after the first injection.

It will aid in the investigation of the therapeutic value of diphtheria antitoxin to recall to mind the nature of the disease. The theory has long been accepted that it is produced by a bacillus which does not enter the general system, but generates a toxin which is readily absorbed and acts as a speedy and deadly poison. The virulence of this toxin is the cause of death except in those cases in which a pseudo-membrane clogs the air-passages. It is believed by the advocates of the antitoxin treatment that the immunity which antitoxin produces checks further exudation, causes the exudate to shrivel and peel off, and arrests the further progress of the disease. Obviously, therefore, in order to be most effectual the antitoxin should be used as early as possible on the first day of the appearance of symptoms. The following have been the approximate quantities used in the asylum for the first injection, and it has been only in exceptional cases that a second was required on the following day: From six to eighteen months, 750 units; from eighteen months to three years, 1000 to 2500 units; above three years, 2000 to 2500 units.

The following table gives the number of cases treated and the result, during the five months ending with December 1, 1896. Bacteriologic and microscopic examination of every case was made by the resident physician, and independently by the Bacteriological Department of the Board of Health. The Klebs-Löffler bacillus was found in every instance:

| | Total Cases. | Died. |
|---|---|---|
| July | 10 | 1 |
| August | 6 | 0 |
| September | 5 | 0 |
| October | 19 | 1 |
| November | 25 | 1 |

The fatal case in July was that of an infant of seven months, admitted in a nearly dying state. It had double pneumonia, and a diphtheritic exudate extending from the tip of the nose nearly to the lungs. Slight as was the chance of benefiting the patient, 750 units of antitoxin was injected, but without any appreciable effect in staying the fatal result. The fatal case occurring in October was that of a female bottle-fed child having enterocolitis of three weeks' duration. She was entrusted to a family in a tenement house September 15, 1896, but remained in a weak and wasted state, and was returned to the asylum October 16th, when she was found to have gangrenous inflammation of the throat, uvula, and tonsils. Her extremities were cool, a bed sore had appeared in the sacral region, her temperature was 101° F., and a culture showed the presence of the Klebs-Löffler bacillus. Without any expectation of benefit, since the infant was nearly moribund, an injection of 1500 units of antitoxin was given, but without effect, death taking place two days later.

The following is the history of the fatal case occurring in November: Mary X., eight months old, was born in the maternity service of the asylum. She was wet-nursed by her mother, and apparently received sufficient breast-milk. The record of November 1st stated that she was pallid, in poor general health, and had had a cough with some acceleration of respiration for three or four days. The temperature was 104.5° F. In the upper lobes of both lungs were heard the râles of pneumonia. On November 5th, dulness on percussion was distinct over the lower two-thirds of the right lung. The pulmonary signs continued, although with apparently some abatement, and on November 12th the temperature was nearly normal. The breath was offensive, but there was no nasal discharge. On November 15th and 16th, two small white points were observed on the uvula, and a culture from them demonstrated the presence of the Klebs-Löffler bacillus. One thousand units of antitoxin was injected. At this time the temperature was 101°F., and both sides of the neck exhibited swollen glands. Death occurred on the following day. At the autopsy the right pleural cavity was found to contain three ounces of thick encapsulated pus lying over the liver and compressing the right lower pulmonary lobe. The right upper and middle lobes also contained small encapsulated collections of pus. Bronchopneumonia was present in the left lower lobe, and the cervical, axillary, and bronchial glands had become hyperplastic. The other organs exhibited no notable change, apart from the emaciation.

It is seen that these three patients were sick, with little prospect of recovery, before the commencement of diphtheria. Of the 65 diphtheritic cases embraced in the statistics of the five months, 12 had symptoms of croup, either in its incipiency or more or less developed. Nine of these recovered under the antitoxin treatment without intubation, while the remaining 3 required intubation only as an auxiliary measure. In these nine cases the croup was apparently checked by the action of the antitoxin. One of the three patients had the following unusual but not unique history, which shows that notwithstanding the efficacy of the serum treatment and the power which it exerts in arresting croup, intubation is sometimes necessary as an adjuvant: Joseph, aged three years, with a pseudo-membrane over each tonsil, began to have embarrassment of respiration and the characteristic harsh cough of croup on November 13th. Antitoxin (2000 units) was at once given. On November 14th, the antitoxic injection not having given relief, the child was intubated and 1500 additional units injected. On November 16th, the tube was removed so as to test the respiration, but the dyspnea necessitated its immediate replacement. The lividity and dyspnea occurred each time the tube was removed during the next three weeks. It was taken out six times, the lime salts, membranous *débris*, and mucopus removed, and then it was immediately reintroduced. After the third week it was no longer needed.

The effect of the antitoxin when the diphtheritic exudation is located in unusual situations is interesting and instructive, as showing its potency and far-reaching influence. Thus, on August 18, 1896, W. M., aged four months, was presented for treatment, his right eye being badly inflamed and both lids swollen. The diagnosis of purulent conjunctivitis was made. A pseudo-membrane covered the under surface of both eyelids, but the exam-

ination of the corneæ was negative. The Klebs-Löffler bacillus was found in the secretions. A drop of atropin was applied to the right eye morning and evening, a compress wetted in a saturated solution of boric acid was constantly applied over the lids, and an injection of 750 units of antitoxin was given in the connective tissue. The eye was clearing rapidly by October 22d, and recovery was soon complete. In two other cases the same quick recovery occurred, one being in a patient upon whom circumcision had been performed, the inflamed surface being covered with a diphtheritic exudate, and the other in a patient having a vaginal ulceration. In both wounds the Klebs-Löffler bacillus was found, and one injection of the antitoxin sufficed to effect a cure.

Delafield and Prudden, in the fourth edition of their treatise on "Pathological Anatomy" (page 149), say: "There is a considerable number of very important inflammatory lesions, closely allied in their character, and commonly, though not always, associated with suppuration which are due to the presence and growth in the body of the spheroidal bacteria or cocci known as staphylococcus pyogenes and streptococcus pyogenes." These forms of cocci, associated with the Klebs-Löffler bacilli, have been present in a majority of cases of diphtheria which I have examined in the Foundling Asylum, and I think that members of the medical staff who have made a greater number of microscopic examinations than myself, have observed the same frequency, or even preponderance, of the cocci, the infection thus being a mixed one. In some cases the diphtheria bacillus occurred alone. The presence of these cocci doubtless aggravates the diphtheritic process unless the latter can be checked in the beginning, before the inflammation produced by the Klebs-Löffler bacillus becomes fully established. Hence, physicians of the Foundling Asylum employ from the first, in order to destroy cocci upon the nasal and pharyngeal surfaces, such applications as a saturated solution of boric acid, or one of the combinations given in the MEDICAL NEWS for August 29, 1896.

Amid all the changes which have occurred in the therapeutics of diphtheria during the last fifty years, the tincture of the chlorid of iron has continued in common use as a tonic and astringent. Recently the syrup of pineapple has been used as an eligible vehicle for the iron in the following formula:

℞—Tinct. ferri chlorid, . . . . . ℥ ii
Syr. ananassæ sativæ . . . . . ℥ iii
Glycerin . . . . . ℥ ss.
Dose: One teaspoonful to a child of three to five years.

The iron has been employed in most of the diphtheria cases which received the antitoxin. No one, it seems to me, can peruse the foregoing statistics, especially if he has had an opportunity to observe that which promised to be a malignant and fatal disease deprived of its malignancy or virulence, without being astonished at the change in the type of diphtheria following the insertion of antitoxin. But there is a large, intelligent, and influential body of physicians who believe that the good results of the antitoxin treatment is due to the change of type in diphtheria. The doctrine of "change of type" of contagious and infectious diseases had its origin in the ancient belief that these affections depended largely upon what was termed "the constitution of the year." The significance of the term has entirely changed since the discovery of the microbic origin of these diseases. It is apparent that the type of a contagious affection must depend largely upon the conditions existing at the time, within and around the persons affected, influencing the life-history of the specific microbe. The whole subject of "change of type" of contagious diseases should be reinvestigated from the standpoint of modern bacteriology.

## MEDICAL PROGRESS.

***Version or High Forceps.***—As the result of a considerable clinical experience, SCHULTZ (*Zeitschrift für Geburtsülfe und Gynäkologie*, B. xxxiv, H. 2, p. 174) formulates the following rules of guidance in the choice of either version or high application of the forceps in cases of difficult labor. Instead of prophylactic version expectancy should be observed. If the amnion has not ruptured, or immediately after escape of the amniotic fluid, version should be practised when an indication exists to terminate the labor at once. If the amniotic fluid has already been lost for some time, high application of the forceps is to be preferred to podalic version. If, under these circumstances, the os uteri is not sufficiently dilated and immediate termination of the labor is indicated, dilatation should be facilitated by multiple incisions or by means of Barnes' rubber bags. The high application of the forceps may be successfully practised in moderately contracted pelves if the os uteri is sufficiently dilated. If the degree of pelvic narrowing is considerable, the high application should be only tentative. In its failure, perforation of the head would be indicated. The high application of the forceps does not demand the same skill as version in order to bring about a successful result for mother and child. It does, however, require dexterity, although not more than any other obstetric operation.

## THERAPEUTIC NOTES.

***The Effects of Certain Laxatives in the Presence or Absence of Bile.***—STADELMANN (*Archiv. für Exper. Pathologie u. Pharm.*, Bd. 37, p. 352,) established permanent biliary fistulæ in dogs, but allowed the animals during the night to lick up the bile which flowed from the fistulæ. Strictly speaking, therefore, they were not absolutely void of bile in their intestines, but the quantity must have been extremely small. Under these circumstances he found that the following drugs lost almost completely their laxative action: podophyllin, jalap, scammony, rhubarb, and convolvulin. Aloes and senna, however, preserved their usual action.

***Buccal Leucoplasia and its Relation to Syphilis.***—According to LEGRAND (*Gaz. Hebdom. de Méd. et de Chir.*, December 20, 1896,) the leucoplasia which develops in

old syphilitics is to be looked upon as a parasyphilitic affection in the same sense as tabes, or general paralysis. This point is important in connection with its treatment, as antisyphilitic remedies in these cases are not only without effect but are annoying and dangerous. The only safe treatment is an early surgical one, for the physician ought never to forget that these leucoplastic areas frequently degenerate into cancer.

***Subcutaneous Injections of Guaiacol with Chloroform.***—COLLEVILLE (*Centralbl. für innere Medicin*, No. 51, 1896,) has obtained good results in various painful lesions by the injection of from fifteen to sixty drops of a mixture of guaiacol and chloroform, in a proportion by weight of four parts of guaiacol to five of chloroform. The injections have only a local anesthetic action, but as they can be frequently repeated without disadvantage, they can be used instead of morphin not only in neuralgia and neuritis, but also to relieve the pain in rheumatism, fractures, etc.

***A Case of Cancer Treated by the Roentgen Ray.***—VOIGT (*Lyon Médical*, No. 51, 1896,) had charge of a man aged eighty-three who suffered great pain from a cancer situated on the left side of the tongue. There was almost constant ptyalism, with difficulty in swallowing and in opening the mouth, and there was neuralgic pain in the ear and in the occipital and facial branches of the facial nerve. For some weeks he had received daily two or three injections of morphin of a third to a half of a grain each. Treatment was then begun with the Röntgen ray, the exposures lasting from fifteen to thirty minutes each. The pain was greatly diminished from this time on. For fifteen days he either received no morphin or else a single dose in the evening to produce sleep. This treatment was continued for two months when the patient contracted pneumonia and died. During this time there was very little pain, and its absence could not be attributed to a destruction of the sensory nerves as sensation was not impaired. Nor can one think of a "suggestion" lasting eight weeks. The cancer continued to grow steadily, ptyalism persisted, and difficulty in swallowing increased. After the eighth exposure there was a marked pigmentation of the skin of the neck which afterward became almost as black as that of a negro.

***Treatment of Post-partum Hemorrhage.***—In an article on post-partum hemorrhage LAIRD (*Lancet*, December 19, 1896,) recommends the following method in obstinate cases: Pass the disinfected hand into the womb, close it, and with the left hand compress the uterine and ovarian arteries against it on each side. If this pressure for a few minutes does not control the bleeding, a swab of absorbent cotton saturated with a styptic and held in the palm of the hand may be squeezed from time to time, and by a slight rotation of the hand the styptic may be smeared over the whole surface of the uterus.

***A New Test for Albumin and Peptone in the Urine.***—YAVOROVSKY (*La Méd. Mod.*, No. 58, 1896,) adds an excess of sodium carbonate to the urine, filters it, evaporates it to one-third of its volume, then filters it again. To 4 cm. of the filtrate is added one drop of a solution of one part of ammonium-molybdid and four parts of citric acid in forty parts of water. If albumin or peptone is present, cloudiness results either immediately or after a certain time. If this is due to peptone it dissolves on warming and reappears on cooling.

***Iodin Injections in Hydrocephalus.***—RANKE (*Jahrb. für Kinderheilk.* Bd. 39, S. 359,) describes a case of hydrocephalus treated by iodin injections. The patient was a child ten months old. The left ventricle was punctured and 320 c.c. of serum was let out. After this 10 grams of tincture of iodin diluted with 20 grams of water was injected into the left lateral ventricle. There was a slight febrile reaction. Within two and a half weeks after the operation a noticeable diminution in the size of the head was observed. About four weeks after the treatment the patient succumbed to a fatal enteritis.

The autopsy revealed an adhesive inflammation of the walls of the ventricle into which the injection was made, with a resulting diminution in the size of its cavity.

***The Best Aristol Ointment.***—FAGEARDIE (*Jour. de Médicine*, December 20, 1896,) who has experimented in order to determine the best vehicle for an aristol ointment, finds that if glycerol of starch is used the aristol undergoes partial decomposition with the formation of free iodin. With vaselin there was no decomposition but the ointment was not very homogeneous. With benzoinated lard there was also a feeble liberation of iodin. With wax and with lanolin no iodin was set free, and the ointment was perfectly homogeneous. These substances are therefore best fitted to be used as vehicles for aristol ointment.

***An Instance of Trional Poisoning.***—GIERLICH (*Centralbl. für innere Médicin*, No. 51, 1896,) had a patient afflicted with morphinomania of a slight degree who, during a period of two months, took daily on account of sleeplessness about 45 grains of trional. Serious nervous symptoms developed. Marked ataxia, a light tremor over the whole body, and a deep depression of mind which could only be broken by strong stimulus were the chief symptoms. The memory was much affected as were writing and speech. There were no delusions. After the trional was withheld (the morphin being continued in the usual dose) the condition gradually improved, but it was five weeks before the last traces of nervous disturbance disappeared. The practical lesson in this case is that if trional is to be given for a long time, the dose must be greatly reduced or omitted altogether occasionally in order to allow its complete elimination.

***Mechanical Massage of the Abdomen.***—OETKER (*Deutsche Med. Wochenschrift*, No. 20, 1896,) recommends as a treatment for chronic constipation mechanical massage by means of a five-pound iron ball, thickly covered with woollen stuff and fixed in a small frame. The patient lies in a horizontal position, and rolls the ball over the abdomen. By experiments upon himself, the author determined that five minutes of this massage was sufficient to produce defecation in less than half an hour, at times of day when it was not his custom to have an evacuation of the bowels.

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## THE HEALTH BOARD AND COMPULSORY REPORTS.

ONE would infer from certain caustic comments recently promulgated that the New York Board of Health was planning a deadly attack upon the medical profession, instead of tendering its most efficient and kindly offices to assist in a grand campaign against the common enemy, tuberculosis. We are combatting a disease that is universally recognized as the greatest scourge of mankind. We shudder at the number of victims of the plague in India, and are ready to adopt the most stringent measures to hold it in restraint. And yet all the victims of this plague up to the present time in the entire presidency of Bombay number but few more than the individuals that fall a prey to tuberculosis in the City of New York alone every year.

The discovery of the tubercle bacillus marked a great epoch in the knowledge of tuberculosis. It was a still greater advance when science pronounced the disease infectious and communicable. But the crowning glory of medicine in this direction was achieved when we were able to say that it is a preventable and curable malady.

The medical profession of New York does not need to be told of the great fatality of tuberculosis, nor does it need further enlightenment to bring conviction of the fact that it is a communicable and a preventable disease. It will therefore be a great surprise if the profession hesitates to lend the power of its influence and its cordial coöperation in every effort to stay its course. The movement recently inaugurated by the Health Board of New York is the beginning of a grand crusade that has no less an aim than the final extirpation of the entire race of tubercle bacilli and the emancipation of mankind from his fatal grasp. This campaign is one of education simply. And it is only necessary for anyone to read the history of the work of the New York Board of Health in its supervision of tuberculosis during the past few years, as set forth in the now famous announcement of January 20th, to see how wisely the object-lessons have been presented to the people in its gradually maturing plan of education. By means of their superior and unusual laboratory and bacteriological opportunities, the medical directors of the Health Board have naturally become the leaders in this movement, and through a system of gradual extension of wise supervision and management of the victims of the disease, have evolved a complete and practical system of control. The success of it depends upon the careful execution of every component part. A weak link in a chain nullifies its entire efficiency. A single slip in one detail of the asepsis of a surgical operation thwarts the whole system. The one important link in this system which the medical profession is asked to supply is to report all cases of tuberculosis that come under its observation. The cases in the early stages, and when found among the class of people who have the intelligence and ability to properly care for themselves, are reported for statistical purposes; the more serious cases, and those found in the less prosperous classes, for inspection and control, if necessary. As the *Medico-Surgical Bulletin* says:

> No one need fear the presence of a scrupulously clean consumptive. It is the dirty sputa of dirty consumptives, and not the bodily presence, that contaminate and endanger. If the patient refuses to heroically act for his fellows (in exercising proper sanitary precautions) he can be shown the necessity of acting to save himself. If he is too stupid to grasp the facts in this direction then let the Board of Health sit in judgment on his case and condemn him to a hospital where he can be watched and compelled to be clean. Isolation is wholly unnecessary if the

patient is scrupulously cleanly. Isolation should be absolutely certain for every patient that refuses [or is unable] to be such.

What more reasonable! What more just!

The Committee on Hygiene of the New York County Medical Society, at the February meeting, presented a report endorsing and commending the action of the Health Board. That wise councils will prevail and this action of the committee be endorsed by the Society at the March meeting when the report comes up for discussion, is the expectation of all who have faith in the wisdom of the majority. The County Medical Association will discuss a motion at at its next meeting condemning the action of the Health Board. This resolution, however, has not been presented by any committee of the Society, and presumably carries only the opinion of the individual who introduced it. In the judgment of so important a measure bearing upon public safety and health there is no place for personal prejudices or exaggerated notions about individual rights and violated prerogatives. The medical profession of New York has shown itself capable on occasion of subordinating to the welfare of the community ill-considered thoughts of personal injustice and of following the illuminated path of scientific truth. These Societies will honor themselves by casting their potent influence on the progressive side of this beneficent movement.

The *Indiana Medical Journal*, in commenting upon this subject, says: "To discourage in any way this effort—even this dream, if so it prove—of relieving mankind is more than editorial atrophy; it is moral obliquity and impiety."

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## THE EARLY DIAGNOSIS OF TUBERCULOSIS.

Whether the diagnosis of tuberculosis in its early stages is simple or not, depends upon what is understood by "its early stages." It is, therefore, rather questionable teaching to maintain that the signs observed even in the earlier stages are easily enough recognized by the merest tyro in auscultation. That localized dulness at the apex, the prolonged, high-pitched expiratory murmur, the circumscribed râles, the hemoptysis, and the dry, hacking cough, are too significant to leave any doubt in the minds of the most casual observer, is true enough. But who in these days would think of regarding such physical signs and symptoms as indicative of an early stage in tuberculosis!

It is indeed commendable in our "merest tyro" to make a diagnosis even at this juncture, and he is to be encouraged in his desire to make such diagnosis, but he must not, by this flattering success, be deluded into the belief that he is recognizing phthisis in its early stage, or hope thereby to stay the progress of the disease. Our "tyro" must be informed that more modern methods of investigation have discovered instruments of such precision and tests of such reliability and accuracy that they discount by many weeks and months the date at which the stethoscope is of diagnostic value. The persistent presence of tubercle bacilli in the sputum of a patient, even when all other diagnostic signs are absent, is a menace to his welfare, and must be reckoned with by the attending physician. On the other hand, localized dulness in the lungs, with prolonged, high-pitched expiratory murmur, and circumscribed râles, with cough, fever, and emaciation, have been confidently conducted to a successful issue, when repeated examination has shown an absence of the bacilli from the sputum.

But a still more delicate criterion, and one that is rapidly coming into use among experts, is the tuberculin test. Koch has used this with most reliable and satisfactory results in five thousand cases in which physical signs were absent, and in which bacilli could not be discovered in the sputum. The Health Board has also been using it in suspicious cases, in which all other tests proved negative, with most gratifying results as to the accuracy of its revelations. And Dr. Trudeau of Saranac, in a recent personal interview declared that after careful and long continued observation he had come to regard the presence or absence of reaction after tuberculin injections as the final and decisive test in cases of supposed cure. In the case of patients who no longer present any clinical evidence of the disease, it is getting to be his custom before declaring them cured and consenting to their return to former homes and occupation, to subject them to the tuberculin test. When no reaction occurs the patient is pronounced cured, but when the characteristic phenomena are present the clean bill of health is refused. In a paper presented recently before the New York Academy of Medicine, the same authority said: "If there is expectoration and the presence of the bacillus cannot

be detected by repeated and thorough examinations, a positive conclusion can often be reached within three weeks by inoculation of the expectoration in the guinea-pig, and when there is no expectoration, by the tuberculin test."

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## THE VASO-MOTOR INFLUENCE OF CHLOROFORM AND ITS RELATION TO CHLOROFORM ACCIDENTS.

The fact that chloroform is a much-used and valuable anesthetic, and that it possesses dangerous properties which have prevented a great many eminent physicians from employing it, renders any information we can gather concerning its effects of superlative interest, first, because conflicting views of pharmacologists and clinicians still are met with in the journals, and, second, because a true explanation of the primary effects of the drug, and the consequent understanding of the course to pursue in order to avoid accidents, will go far toward overcoming its dangers.

The first fact to be borne in mind is that the students of the effects of chloroform have been divided into two schools, the one asserting that the danger to be apprehended from the use of the drug lies in its effect on the respiration; the other, that it paralyzes the heart and causes death by this means. It was to decide this mooted point that the various Hyderabad commissions were appointed, and that a very large number of other investigations have been carried out, among which may be named, as having been published in America, those of H. C. Wood, and the author, and others under the direction of the Hyderabad Government by the author and his assistant, Dr. Thornton, Demonstrator of Therapeutics in the Jefferson Medical College. There have been other studies of the subject made in England, notably by Gashell and Shire and by MacWilliams. These more recent studies, combined with the older ones, prove one point, viz., that chloroform is a depressant poison to all living protoplasm when brought in direct contact with it, and whether the protoplasm be nervous, muscular, or corpuscular the same lethal influence is produced if the drug be present in a concentrated form. We may start out with the fundamental fact, therefore, that the dominant action of chloroform is depressing, and that, if it comes in contact with the heart even in medicinal quantities, it tends to weaken that organ. On the other hand, if it comes in contact with the respiratory center, this protoplasm is depressed to a degree dependent upon the actual quantity of chloroform used and the individual resistance of the vital parts to its influence.

It is thus easy to understand that on one animal or human being, either in health or disease, the drug may exert a very positive effect on both the respiratory function as well as on the heart, or may expend its chief influence on one of these alone. Thus a very slight degenerative process in the heart muscle or its nervous centers, or even its dilatation and engorgement caused by violent struggling, might render these parts unduly susceptible; or the respiratory center, from some similar cause, may feel the chief brunt of the drug. I believe that it is possible for death to result from chloroform inhalation by either heart or respiratory failure, but I also believe that cases of the former are very rare, and of the latter much more common. In the first named class of cases disease of the heart is present, and there is every reason to believe that many of the chloroform deaths from heart failure, so-called, would have occurred if the patient had had to submit to an operation in which an anesthetic was not used. Indeed, there are cases on record, prior to the use of anesthetics, in which death took place from the fright and pain attendant upon the simplest surgical procedures.

The mere fact that a pulseless radial artery is found during a chloroform accident is not proof positive of heart failure, and it is interesting to note that in the cases of accident through the use of the drug collected by Thornton and myself from private sources, nearly all were reported as being due to respiratory and not cardiac causes.

In admitting that chloroform exercises a depressant effect on the heart and respiration, particularly the latter, I wish to emphasize one fact, about which there is little or no conflict of opinion in laboratory or practical test, namely, that the dominant or overshadowing influence of chloroform is upon the vaso-motor centers; and I cannot lay too much stress upon the fact that an intact vaso-motor system is as essential to life as an intact heart. The action of the heart is so closely associated with the state of the blood-vessels as to be altered the moment the arterial pressure rises or falls, for the heart, after all, is

nothing more than a highly specialized part of the vascular apparatus. The capillary area of the body is so many times greater than that of the arteries that, if the arterioles relax and allow the blood to flow freely into the vast capillary networks of the muscles and glands, no blood will find its way to the veins or to the heart. Even if the heart is intact, it cannot pump blood if none is returned to it by the veins, and the familiar condition of unconsciousness, or syncope, known as "fainting," takes place. This is exactly what occurs when a patient has a sudden "bad turn" under chloroform. The agent has caused sudden dilatation of the peripheral blood paths by depressing the vaso-motor center, and the patient faints. If so much chloroform has been used that the center cannot recover itself, death occurs, for the man is bled to death in his own vessels. This condition explains the loss of the radial pulse, the failure of respiration, and the sudden peril of the patient.

Now as to the evidence to prove that the dominant action of chloroform is to depress the vaso-motor center: the experiments of all, or nearly all, investigators have shown that this drug, as ordinarily given, produces a fall of pressure, although in the first moments of inhalation there may be a rise which is due to excitement. Bowditch, Minot, Couts, Wood, the Hyderabad commissioners, my own studies, with and without Thornton, and all teachings I have ever seen, prove this fact. This is the experimental evidence; the practical evidence lies in the fact that accidents from chloroform anesthesia result more frequently when the drug is given to a patient who is in the erect or semi-erect position than when lying prone. Inversion of the body of the patient under these circumstances, even in apparently hopeless cases, will often serve to resuscitate him by causing a portion of the blood to enter the feebly beating heart from the veins, and so reach the vital centers in the medulla, as well as filling the coronary arteries, an equally important matter. Again, accidents from the use of chloroform are exceedingly rare in parturient women, because the compression of the abdominal vessels cuts off a large vascular network and the pains stimulate the vaso-motor center. Then we know that if atropin, a valuable vaso-motor stimulant, is given before the administration of chloroform, the later drug may be given with greater safety. Finally, I wish to mention an important clinical observation. On one occasion I gave chloroform to a feeble woman whose condition demanded an abdominal section. The face suddenly became pallid, the radial pulse disappeared, and the heart sounds could not be heard. The operator immediately grasped the abdominal aorta to determine if the heart had ceased to beat, and as he compressed it the pulse in the radial artery at once returned. The compression of the artery prevented what little blood the heart had to pump from flowing onward and stagnating, and, by restoring to a certain degree the normal pressure, produced a tonic cardiac influence; for the normal heart must have arterial resistance in order to perform its proper functions.

My conclusions, therefore, are that chloroform generally kills by its vaso-motor poisoning effect, which deprives the heart and respiratory center of blood, and simultaneously the drug itself aids in the embarrassment of these parts. From these conclusions we may draw the following practical deductions:

1. In all cases when chloroform is to be given to a feeble patient the extremities should be tightly bandaged.

2. Atropin should be given as a vaso-motor stimulant.

3. A large compress should be tightly bound over the abdomen if this is at all relaxed, or if an accident occurs.

4. The patient should be inverted, if syncope occurs.

5. Artificial respiration, performed by compressing the floating ribs and precordium, should be employed to aid in the circulation of the blood, to pump the chloroform vapor out of the lungs, and to aid the respiratory center in its functions.

6. During the use of chloroform the respirations should be watched for two reasons, (*a*) because the depth and rapidity of the breathing is a gauge of the amount of chloroform inhaled (for the amount on the inhaler is not the dose), and, (*b*) because as the blood pressure falls, the respiratory center becomes disturbed in its function and the irregular breathing shows that the chloroform is disturbing it. Further, irregular breathing means irregular dosing, for twenty deep inspirations a minute means more chloroform inhaled than twenty shallow ones. The respiration is the dose gauge.

7. It is useless to resort to saline transfusion in chloroform syncope, for the vessels of the body can hold many times the amount of blood in them, and unless quarts are transfused, the relaxed vascular system simply absorbs the fluid and cannot be filled.

Finally, let me mention a statement of Leonard Hill, in his excellent brochure on "The Physiology and Pathology of the Cerebral Circulation," recently published, in which he shows that chloroform so lowers blood pressure that, though the heart is still beating and draining a trickle of blood into its coronary arteries, it does not supply the respiratory center, if the blood paths are relaxed by chloroform, but that abdominal pressure restores the flow.

I could cite numerous examples in proof of the sudden and serious effects of suddenly relaxing the blood paths, but the facts I have adduced seem sufficiently convincing, and the old discussion as to whether chloroform kills by cardiac or respiratory failure, seems fair to be decided, to the effect that the influence on those functions is indirect, and that the vaso-motor effect is the important factor.[1] When chloroform is taken, blood pressure falls, the respiration is disturbed, the dose of chloroform is excessive, and the drug aids the anemia of the vital centers by a direct depressing influence.

H. A. HARE, M.D.

## ECHOES AND NEWS.

***An Epidemic of Scarlatina.***—The alarming spread of scarlet fever at the State Normal School at Bridgewater, Mass., has caused the closing of that institution.

***Western Ophthalmological, Otological, Laryngological, and Rhinological Association.***—The second annual meeting of this Association will be held at St. Louis, April 8 and 9, 1897, and promises to be of much interest.

***Expectorating in Cars.***—It is reported from Chicago that a well-known lawyer, of prominent social and political position, has been arrested for expectorating in a street car. He threatens to sue the company for $50,000 damages.

***Insanity in Egypt.***—So far as could be ascertained the causes of insanity in the 477 cases treated in the government asylum of Cairo, Egypt, last year, were: Hasheesh, 88; alcohol, 9; syphilis, 27; pellagra, 11; epilepsy, 17; sunstroke, 2; grief, 30; religious excess, 16.

[1] For facts showing that the apparently arrested heart is really beating in many supposed instances of cardiac cases, see my report to the Indian Government (*Therapeutic Gazette*, October, 1893), and my recent papers in the *Therapeutic Gazette*, February, 1897.

***Bellevue Chapel Dedicated.***—The Arthur Leary Memorial Chapel of the Blessed Sacrament, on the grounds of Bellevue Hospital, was dedicated February 28th. Archbishop Corrigan officiated. The sermon was a tribute to the memory of Arthur Leary and to the generosity of Miss Anna Leary, his sister, who erected the chapel.

***To Investigate the Plague.***—The Academy of Sciences of Vienna has sent to Bombay a commission composed of Dr. Hermann Müller, Dr. Ghon, Dr. Albrecht, and Dr. Pöch, to investigate the nature of the plague. The expenses are defrayed by the Treitle fund left to the Academy by the late Herr Treitle, and amounting to $500,000.

***A Lectureship in Bacteriology.***—The Linnean Society of New South Wales to which reverted the sum of $60,000 for the establishment of a lectureship in bacteriology, is now prepared to equip a laboratory, and desires to receive applications for the lectureship. The salary is $1750 per annum.

***Electricity Without Heat.***—By the use of chemicals in a small battery constructed by himself, Willard E. Case of Auburn, N. Y., has oxidized coal without the aid of heat and produced sufficient electricity to set a bell ringing. In a recent demonstration before the New York Electrical Society, he also made use of human blood in the same way, drawing the oxygen from the air, and produced an electric current.

***Consumption in Cleveland, Ohio.***—The Health Department of Cleveland announces that tuberculosis was the principal cause of death in that city in 1896. There were 265 cases. Cholera infantum came next with 255 fatalities, diphtheria 177, and typhoid fever 143. The frequency of death due to consumption seems to point out the necessity for proper isolation and other regulations. Work is now being done along these lines.

***School Inspection Plan Delayed.***—The N. Y. Health Department had anticipated putting into operation its plan for the daily medical examination of school children February 1st. This has been delayed, however, because the Civil Service Board has not yet finished an eligible list of the 218 physicians who were examined for appointment to the corps of medical school inspectors. Until it is furnished the board can make no appointments.

***New York's Clean Streets.***—The healthfulness of New York has been greatly enhanced by the clean condition of the streets. It is expensive but it pays. In a recent communication on the subject Colonel Waring says: "We have considerably less than 400 miles of paved streets on this island, and it costs us pretty nearly $3,000,000 a year to keep them in order. We sweep sixteen miles from three to five times per day; over 200 miles twice a day, and the remainder once a day."

***Obituary.***—Henry A. Creamer, M.D., of Brooklyn, died February 20th of pneumonia, after an attack lasting about a week. He was a native of Brooklyn, a son of the late Dr. Joseph Creamer, ex-police surgeon, and brother of Dr. Joseph M. Creamer, ex-coroner of Kings County.

He was graduated from Bellevue Hospital Medical College in the class of 1892. He was a member of the Physicians' Mutual Aid and New York State Medical Associations.

***New Training School for Nurses in Brooklyn.***—The Commissioners of Charities and Corrections of Kings County propose to establish at the County Hospital a school for nurses. The need of this school has been felt for a long time but has been of necessity deferred because of the lack of room. The Commissioners are expecting an increased appropriation which will enable them to provide the additional accomodations, as well as certain wards for convalescents.

***Civil Service Appointments.***—The following appointments were announced February 15th from the State civil service eligible list at Albany, N. Y.: Dr. Henry Harlow Brooks, as Associate in Bacteriology at the State Pathological Institute in New York City; salary, $500. Dr. Arnold Graf, as Associate in Biology at the same institute; salary, $900. Dr. Henry P. Frost of the Willard State Hospital, as First Assistant Physician in the Buffalo State Hospital.

***A Popular Hospital Fund in London.***—The Prince of Wales has issued to the English Press a communication in which he suggests the creation of a fund to be called the Prince of Wales' Hospital Fund for London, to commemorate the sixtieth anniversary of the Queen's accession to the throne. The object is to secure about £150,000 annually by subscriptions of a shilling and upward to meet the needs of the hospitals which are not met by existing funds.

***Inspection of School Children in New York.***—*Pediatrics*, in commenting on the recent regulation of the Board of Health regarding the inspection of the public schools, says: "A school inspector might be tempted to add to his salary of $300 a year by taking charge of such cases as he may detect in his rounds of inspection, thereby robbing the regular family physician of a patient;" and suggests that the Board of Health pass such rules as will safeguard the general practitioner and remove from the inspectors the temptation to use their opportunities to their own advantage.

***The Passaic Valley Sewerage.***—The report of the Passaic Valley Sewerage Commission has been submitted to the New Jersey State Legislature. The conclusions of the commission are that the Lower Passaic River is so polluted as to constitute a public nuisance, requiring immediate remedy, and that an act of the Legislature should be passed authorizing the construction of a trunk sewer and branches to conduct the sewage of the cities and towns along the lower river to the tide water of Newark Bay.

***The Wisconsin Diploma Mill.***—It is reported from Chicago that Frederick Rutland, who calls himself a doctor, and President of the Wisconsin Eclectic Medical College, has been arrested by the government officers on the charge of using the mails to defraud. It is claimed he has been issuing fraudulent medical diplomas upon the payment of sums ranging from $10 to $50. His method has been to allow the student to "study at home," and then to forward a diploma upon receipt of the money and the answers to a set of questions. He claims to have graduated 907 students last year.

***Diphtheria Antitoxin Still in Demand.***—In the recent discussion on diphtheria before the N. Y. Academy of Medicine, Dr. Winters remarked that it was a significant fact that while the New York Board of Health one year ago kept eight horses for the production of antitoxin they now had only four. In reply to this, Dr. Park of the Board of Health, said that at the present time the serum sent out by the Board was five times as strong, bulk for bulk, as formerly, and this explained the fact that fewer horses were therefore needed. As a matter of fact, however, nine horses instead of four were now used for this purpose.

***Report of Committee on Hygiene of the New York County Society.***—Realizing the need of proper measures to prevent the spread of pulmonary tuberculosis, and regarding it as an essential preliminary that all physicians be impressed with the importance of making an early diagnosis of the same by microscopical examination of the sputum, we earnestly recommend that physicians avail themselves of the offer of the Bacteriological Department of the Board of Health to make such examinations. We approve of the compulsory reporting of cases of pulmonary tuberculosis, if the inspectors are forbidden to visit or to have any communication with the patients without the consent of the attending physician, believing that the attending physician is capable of giving all the necessary instructions. W. H. Katzenbach, Chairman; J. Harvie Dew, Robert C. Myles, Chas. N. Dowd, Egbert Le Fevre.

***Western Surgical and Gynecological Association.***—The sixth annual meeting of this flourishing association was held in the Senate Chamber of the State House at Topeka, Kan., December 28 and 29, 1896, and was largely attended. Many interesting papers were read and discussed. Denver was chosen as the next meeting place. For the ensuing year the following officers were chosen: President, Dr. Joseph Eastman of Indianapolis, Ind.; first vice-president, Dr. D. S. Fairchild of Clinton, Ia.; second vice-president, Dr. B. B. Davis of Omaha, Neb.; secretary and treasurer, Dr. Herman E. Pearse of Kansas City, Mo. Executive board—Dr. L. Schooler of Des Moines, Ia.; Dr. M. B. Ward, of Topeka, Kan.; Dr. T. J. Beattie of Kansas City, Mo.; Dr. C. Lester Hall of Kansas City, Mo., and Dr. J. P. Lord of Omaha, Neb. Dr. W. W. Grant of Denver was chosen chairman of committee on arrangements.

***The Health of Chicago.***—During the month of January the total number of deaths from all causes in Chicago was 2026, or 1.25 per 1000, the population reckoned at 1,619,226. Of this number, consumption claimed 187 victims, pneumonia 290, bronchitis 172, diphtheria and membranous croup 76, cancer 67, typhoid fever 38, other acute intestinal diseases than typhoid 139, heart disease 105, and nervous disease 186. Two hundred

and seventy-three cases of diphtheria and 87 of scarlet fever were reported, and 11,733 persons were vaccinated. Of the reported cases of diphtheria, 125 were bacterially verified as true cases of the disease, and 120 of the patients received treatment with antitoxin, 112 of whom recovered. Ninety-eight persons received immunizing doses of antitoxin, and none of these developed the disease. It is interesting to note that the age of those attacked ranged from a few weeks to over ten years, and that of those who recovered 17 received the injection on the first day of the disease, 29 on the second day, 29 on the third day, 21 on the fourth day, and 28 on days later than the fourth. Of the fatal cases, 1 patient was injected on the second day, 3 on the third, 1 on the fourth, and 3 later than the fourth day. All of the cases resulting fatally had severe complications, the gravest being one of nasal diphtheria with septic pachymeningitis. Four were intubation cases. Forty per cent. of all cases showed a mixed streptococcus and staphylococcus infection.

***Regulation of Hospital and Dispensary Work in the District of Columbia.***—The Medical Association of the District of Columbia has adopted the following resolutions: (1) That every institution for medical charity shall require from every applicant for relief in a hospital or dispensary, a written certificate to be obtained as hereinafter provided. Emergency cases are to be exempted from this rule. (2) That such certificate be obtained from Physicians to the Poor, the Board of Associated Charities, and any registered physician. (3) That cases of sick and injured persons found upon the streets, in the stations, or elsewhere, who require immediate treatment, shall be carried to the Emergency Hospital, or to the nearest hospital having an emergency service, or to their homes, if so directed by the patient or his friends. (4) That emergency patients shall not be detained longer in such institutions than the necessity of the case imperatively demands, but shall be discharged from the service and sent to their homes or to some public hospital as the patient may elect. (5) That members of this Association shall be entitled to the privilege of attending private patients occupying private rooms in any of the public hospitals of this city. (6) That in future the members of the medical staff of hospitals when attending medical or surgical cases in private pay-rooms shall insist upon proper payment for their services, except in the case of such patients who are clearly unable to pay for same. (7) That whenever the medical staff, or a majority thereof, of a hospital or dispensary resigns, and, when after due hearing, this Association finds that the resignations were for just and sufficient cause, it shall be forbidden for any member of this Association to accept a position on the staff of said hospital or dispensary. (8) That whenever one or more members of the medical staff of a hospital or dispensary are dismissed, and when after due investigation, this Association finds that such dismissal was without just and sufficient cause, it shall be forbidden for any member of this Association to fill the vacancy created thereby. (9) That complaints made under Rules 7 and 8 shall be made in writing to the Standing Committee, which after due consideration shall report its findings to the Association.

***Serum Diagnosis of Typhoid Fever.***—Dr. Gehrmann and his assistant, Dr. Wynkoop, of the Chicago Board of Health, furnish the following note concerning their work with the Widal-Johnston application of the Pfeiffer test for typhoid fever: "The systematic examination of suspected typhoid cases for physicians was begun by the laboratory November 20, 1896. Up to January 31, 1897, 158 cases had been subjected to the test. In 99 cases the typhoid reaction was observed, and in 59 it was absent. In 57 cases, subsequently proved to be typhoid from the clinical course, the reaction failed in 5 and a negative report was rendered. We attribute this to the hurried examination often required, and failure upon the part of the physician to send enough blood. Pseudoreactions have been numerous. Eight cases of pneumonia and one case of bronchitis and pleurisy, giving typical pseudoreactions, were of special interest, in that this is the greatest number of cases of any one disease other than typhoid examined by us. The reaction was entirely absent in only one instance—where the clinical diagnosis was pneumonia. Owing to the increased occurrence of pseudoreactions where the dried blood, with all its albuminous elements, is used, we have decided regularly to delay reporting the result until from eighteen to twenty-four hours after beginning the examination. This may cause some inconvenience to physicians, but by waiting the reaction can be so far verified as to make it really pathognomonic. The additional evidence toward the diagnosis is obtained by observing the increasing development of the reaction when the preparation is maintained at blood heat, or by the entire disappearance of the pseudoreaction and a very marked increase in the numbers of bacilli present. We have found that it is not specially necessary to use attenuated or old typhoid cultures to obtain good results when the observation is prolonged for such a period. The reverse of the typhoid-serum diagnosis in the differentiation of cultures from water is now used in such cases as show growth for the typhoid-coli group of organisms by the method of Parietti. So far no culture has been isolated from the water supply of the city that would give the reaction with serum from typhoid cases, although we have recently found *B. coli communis* in a number of instances. It has been impossible on this account to make use of the method for rapid diagnosis of typhoid in water as was at first hoped. Apparently it can be of value only in the differentiation of cultures after the usual methods of separation of suspicious organisms."

## CORRESPONDENCE.

### *OUR PARIS LETTER.*

[From our Special Correspondent.]

DIPHTHERIA GERMS IN THE NORMAL THROAT—DIFFERENTIATION OF PATHOGENIC BACTERIA—BEHRING'S MODEST VISIT TO PARIS—NOCARD WINS THE LACAZE PRIZE.

PARIS, February 4, 1897.

AFTER having labored long and conscientiously to make it clear that certain particular forms of bacilli were

always the necessary cause of certain specific diseases, it would seem now as though bacteriology was about to confess that pathogenity is not essential to any form of bacillus; that one may have present certain special forms of bacilli, that up to this have been considered specifically pathogenic for certain diseases, without the production of those diseases; in other words, that the pathogeneity of a bacillus, or family of bacilli, is dependent upon some modifications of the bacillus due to climatic or nutrient conditions, or due to its passage through individuals under certain circumstances, causing an increase in its virulence.

Probably the first thing that set the current of thought seriously in this direction was Roux' and Yersin's discovery of the diphtheria bacillus in a large number of normal throats, and in parts of the country where diphtheria had not been epidemic for years. This experience is not uncommon in America and has been made one of the stock arguments—probably the most effective one—against the statistics of diphtheria as treated by antitoxin, there being no doubt that numbers of cases are treated as diphtheria by the antitoxin that would not have been considered diphtheria at all a few years ago; bacterial diphtheria it may be, but without the clinical symptoms.

After this came the description of various technical methods of differentiating two very important bacilli (Eberth's typhoid bacillus and the cholera bacillus) from a host of very similar bacilli rather widely spread in nature. For a good many years this effort at differentiation was thought to be successful, though newer and constantly newer technical methods had to be invented, each more complicated than the last, in order to enable the bacteriologist to decide with certainty as to the presence of the specifically pathogenic germ for these two diseases. Water statistics collected during the years that marked the progression in technical manipulations became almost completely valueless from the standpoint of typhoid and cholera.

Now the leaders seem to be giving up the effort at further differentiation and are coming around to the view that it is a family of bacilli one has to deal with in each of these diseases. Some of the members of each family are specially pathogenic and some are not. These last may become virulent under certain conditions not well understood, but the main one seems to be the passage of the bacillus through one or more individuals whose lowered resistive vitality make them subject even to the originally attenuated virulence of the bacilli. This gain in virulence by passage through a series of animals is, of course, well known and founded on any number of observations.

Roux, in his lesson on typhoid before Christmas, in the course at the Pasteur Institute, showed how strongly his views were tending toward the belief that changes of virulence dependent on biotic changes in the protoplasm of microbes were the rule rather than the exception and that microbes specifically pathogenic at one time may not be so at another; or, what is still more important, that non-pathogenics may become, at a given moment, virulently pathogenic. In his remarks on diphtheria, the same tendency was evident. Metschnikoff, in his masterly review of the microbiology of cholera, that maze out of which there seems no sure road, and which has been for him a subject of very special study, gave as his conclusion that the comma bacillus, usually considered as the cause of cholera, was widely spread in water in many places, practically all over the world, and that its specificity in the etiology of cholera was due to extrinsic circumstances that modified its virulence. This, too, despite the claims that are made for Pfeiffer's reaction as a criterion by which to separate the true and false cholera bacillus, for in the lakes at Versailles, where there had been no cholera for years and where there had never been anything approaching an epidemic, it being one of the few places close to Paris always exempt, bacilli were found that, after having been submitted to all the tests possible at the Pasteur Institute, were pronounced indistinguishable from true cholera bacilli. They were then sent to Pfeiffer himself at Berlin, who announced that some of them reacted positively to his test and were to be looked upon as true cholera bacilli, though others did not.

Duclaux, who is Pasteur's successor as the Director of the Institute Pasteur, is giving a series of lessons on the biological chemistry of water. He, too, shares the opinion that it is a family of bacilli sometimes pathogenic, sometimes not, and widely spread in nature that we are dealing with in the microbiology of typhoid and cholera. With regard to typhoid, he is as positive as is Metschnikoff regarding cholera. He referred especially to some work unpublished when he spoke, but which has since been reported to the Society of Biology. Two physicians in the military service at Val de Grâce have found, as far as all bacteriological tests are concerned, true typhoid bacilli in the dust of the floors of wards in the hospital where there had been no typhoid cases for years. Duclaux deprecates that this seems to make doubtful the hygienic precautions with regard to water supply that seemed so simple and so sure. For it would seem that these bacilli are so widespread in nature and so liable to become pathogenic, though they may not have been before virulent, that the simple hygienic precaution of protecting the water supply from human contamination, thought all-sufficient up to this time, may prove illusory.

It has just leaked out that Behring, returning from his wedding tour, stopped off at Paris to visit the Pasteur Institute, but with the distinct understanding that he was to be absolutely incognito to the general public. He and Roux are great friends, it seems, and are rivals in more than serum-therapy, for from this incident Behring would seem to shun popular acclamation as much as does his confrère of the Pasteur. Behring would have been given a very flattering reception in Paris by many more than the medical profession had he cared to accept it. This charming modesty of the true scientist is really delightfully refreshing as a change from the selfish, childish pretension one sees so much of in the lesser lights of the profession, whose little candles, verily, will not be hidden under a bushel if they can help it.

In company with Roux, Behring visited Alfort, where,

with Nocard, he saw the action of Marmorek's serum in a case of anasarca of the horse, a streptococcic disease common enough here in France. It would have been interesting to see the three men, whose names are greatest in that new world on which is rising the sun of serum-therapy, making their observations together on the sick horses at Alfort. One wonders if the antivivisectionists would not realize after a sight like that how much of good for the animals is coming, too, from the experiments made on a few of them by the scientists, and how closely their health is bound up with that of human beings in the advances that are being made. Behring pronounced himself as assured of the success of Marmorek's serum.

In an interview with Capitan published in *La Médecine Moderne*, he is reported to have said that he had complete confidence in the serum for the cure of the bubonic plague that is being made at the Pasteur Institute, and with which Yersin's successes had just been reported at the time of his visit. Behring said a little, but very little, of his own work at present. He has an antituberculous serum that, injected into guinea pigs at the same time with the bacilli of tuberculosis, prevents them from dying from the disease. He thinks that this would be successful in human beings, in cases of acute tuberculous meningitis or generalized tuberculosis; but, in general, the amount of the toxin of tuberculosis circulating in the blood of a consumptive patient at any given time is such an indefinite affair that the dosage of the antitoxin is difficult to arrange.

The Academy of Medecine has just announced that the Lacaze prize of 10,000 francs is conferred upon Prof. Nocard of Alfort for his work on tuberculosis. His labors on the diagnosis and prophylaxis of bovine tuberculosis with Koch's tuberculin are very well known. He it is who pointed out very clearly the virulence of the blood, meat, and milk of tuberculous cattle, after having shown the identity of bovine and human tuberculosis. His work with Strauss on the rôle of contagion rather than heredity in the production of tuberculosis is also well known. The comparatively recent discovery by himself and Roux that cultures of the tubercle bacillus could be readily and rapidly made in ordinary culture media to which glycerin had been added has made observation of the bacillus much easier, and has brought much nearer to us the possibility of serum-therapy for tuberculosis.

## TRANSACTIONS OF FOREIGN SOCIETIES.

### London.

PERFORATING TYPHOID ULCER SUCCESSFULLY SUTURED—PERFORATION OF THE GALL BLADDER OCCURRING IN TYPHOID FEVER—LIGATION OF THE SUBCLAVIAN ARTERY FOR TRAUMATIC ANEURISM—HEMOPERICARDIUM—RESECTION OF THE SIGMOID FLEXURE FOR CARCINOMA—SUCCESSFUL SUTURE OF A PERFORATING GASTRIC ULCER.

AT a meeting of the Royal Medical and Chirurgical Society, held January 26th, BRUNTON and BOWLBY reported a case of *perforating typhoid ulcer successfully treated by laparotomy and suture*. The patient, a man aged thirty-seven years, was admitted to the hospital at the end of the second week. The typhoid fever was of a severe type. It was complicated by hemorrhage and by a relapse, which occurred at about the end of the sixth week and lasted nearly a fortnight. Four weeks after the subsidence of fever there was a severe attack of abdominal pain, followed after some hours by tympanites and symptoms of obstruction, but without nausea or vomiting.

Eighteen hours after the attack of pain began the abdomen was opened in the middle line below the umbilicus. No gas or fecal matter was discovered until the adherent omentum was separated from the coils of small intestines. Then about half a pint of dirty serous fluid mixed with intestinal contents escaped. With little trouble an indurated coil of intestine was separated and drawn out of the abdomen. The perforation was about the size of a small pea, and was situated opposite the mesentery in an area of induration thought to be an inflamed Peyer's patch. The opening was closed by ten silk sutures introduced according to Lembert's method, the outer row of which passed through normal bowel. The suture line was tested and found to be water-tight, and the lumen of the bowel at this point was not unduly constricted. Thick masses of old and recent lymph were removed from the other intestinal coils, and the abdomen was irrigated with hot water until all foreign matter seemed to be quite removed. A drainage tube was passed into the pelvis and the wound sutured. The operation lasted forty minutes, and was not followed by collapse. Recovery was uneventful. The tube was removed in forty-eight hours, and for four days nothing was given by the mouth except water in teaspoonful doses. The bowels moved on the fifth day, after an enema. For several weeks after the operation the patient had a slight, dragging pain in the abdomen, but this gradually passed away. The case was one unusually well adapted to operation and can not be compared with those cases in which perforation occurs during the height of the fever in patients greatly prostrated by the disease.

HERRINGHAM and BOWLBY reported a case of typhoid fever in which laparotomy was performed during convalescence for the relief of symptoms supposed to be due to perforation. No lesion was found, and recovery followed. This case throws doubt upon the recorded spontaneous recoveries after supposed perforation in typhoid fever. It has been pointed out by Fitz that there are no trustworthy signs which are pathognomonic of perforation. Symptoms similar to those which occur after perforation, namely, acute pain, frequent vomiting, and small pulse, with rigidity and tenderness of the abdomen, may be due to a local peritonitis, or simply to constipation.

MOORE thought that the usual date for perforation is not as early as is often stated. It is of assistance to remember that the perforation is usually near the ilio-cecal valve. Out of twenty-one consecutive cases at St. Bartholomew's Hospital the perforation was found to be within two feet of the valve in one-half of the cases, and within three feet of the valve in three-fourths of the cases. He said he had never seen any adhesions at the *post-*

*mortem* which would indicate the spontaneous healing of the perforation.

GOODALL thought the symptoms in some of the reported cases which recovered spontaneously might be due to a suppurating mesenteric gland.

HAWKINS described a case of *perforation of the gall bladder occurring in typhoid fever*. Jaundice occurred about one week after the beginning of the disease, and was preceded by severe pain in the right hypochondriac region, as well as in the lower portion of the right axilla. This pain increased and extended to the umbilicus. There was a temperature of 105.8° F., and a dry pleurisy developed on both sides. Three weeks later the patient died with extreme cyanosis, respirations of about sixty per minute, and more or less constant hemorrhage from the bowels. At the autopsy the right pleural cavity contained ten ounces of turbid fluid. There was slight consolidation at the base of both lungs. The gall bladder was adherent to the peritoneum about a perforation in its anterior wall. It contained a free gall stone and a quantity of purulent fluid.

HARLEY mentioned a similar case. Adhesions prevented extravasation, but an epigastric swelling developed. This was excised, and many small calculi and some colorless bile were evacuated.

CROLY showed before the Clinical Society, January 22d, a case of *ligation of the second part of the subclavian artery for aneurism* in a man aged thirty years, who was stabbed with a pair of tailor's scissors. The hemorrhage was stopped without difficulty, but a tumor formed above the clavicle, which pressed on the brachial plexus and greatly disturbed the health of the patient, causing also pain and paralysis. Two years after the injury the subclavian artery was tied with ligatures made of gold beaters' skin. The radial pulse returned in four weeks, and the paralysis rapidly improved.

MOULLIN showed a case of *hemopericardium*. The patient, aged twenty, was struck on the sternum during a football game. He continued playing for twenty minutes, and then returned home and suddenly collapsed. There was some difficulty in swallowing, and great pain on the left side. The temperature was 96°, F., and the pulse 60. No urine was excreted for twenty-four hours. Thirty-six hours after the accident a violent cough, with profuse expectoration, developed, with a pulse of 140, respiration of 22, and temperature of 100.4°, F. The area of cardiac dulness gradually increased. Three weeks later he was seized with dyspnea, and the whole of the left chest was found distended and motionless. The heart sounds were audible only in the second right interspace. The pericardium was incised in the fifth space, and a drainage tube inserted. Within three hours six pints of fluid blood escaped and clotted firmly in a basin. Dyspnea at once disappeared. The tube was removed on the following day, and the patient was able to sit up at the end of a week. The left lung remained collapsed for a long time, although there was finally perfect recovery.

LUCAS ligated the femoral artery for elephantiasis, following thrombosis of the left internal saphenous vein, in a man aged forty-five. Primary union followed, and three weeks later the circumference of the calf was two inches less than before the operation.

At a meeting of the Medical Society, held January 25th, ALLINGHAM showed a patient, aged sixty-four, from whom he had *removed a portion of the sigmoid flexure containing a carcinoma*. Bobbins of decalcified bone were used to make an end-to-end approximation, There was a slight feco-purulent discharge through the wound, but this soon ceased of itself.

TURNER had occasion to perform laparotomy twice upon the same woman for strangulation of the bowel. At the first operation the strangulation was found under a band in the right iliac fossa. There was a rapid and complete recovery. Six months later she was seized with sudden pain and vomiting, and the abdomen was reopened. Strangulation had taken place under a band in the right hypochondriac region. This band was due apparently to inflammation associated with the previous attack,

At a meeting of the Pathological Society, held February 2d, STEPHENS and PARFITT showed specimens of three cases of hemorrhagic diphtheria. In all of them purpura and hemorrhages from the mucous membranes developed, with death from septicemia. In every case cultures from the lungs contained diphtheria bacilli. Cultures from the blood in one case contained diphtheria bacilli, in another pneumococci, while in the third both diphtheria and streptococci developed.

Before the Esculapian Society January 22d, SILCOCK described a case of perforating gastric ulcer occurring in a young unmarried woman. He sutured the perforation twenty-four hours after the attack commenced, with complete success. The perforation was in the anterior wall of the stomach toward the cardiac end. The gastric contents had escaped freely, producing peritonitis. Owing to the thickened and friable condition of the stomach wall about the perforation, the stitches in its immediate vicinity would not hold, and it was necessary, therefore, to fold into the organ a considerable tuck, a procedure that has been made use of to cure dilatation of the stomach.

At a meeting of the Liverpool Medical Institution held January 28th, THOMAS showed a girl aged fifteen upon whom he had operated for "saddle nose" by inserting a piece of celluloid under the skin. The deformity was thus completely corrected, and the celluloid had remained in position for seven months without causing any inconvenience.

BANKS related a case of a girl struck in the abdomen by a "swing-boat." There was a central abdominal swelling from the xiphoid cartilage to the umbilicus, and pain, vomiting, and fever. A median incision revealed the great omentum spread over the tumor. Through it a trocar was introduced, and thin greenish fluid escaped. A drainage tube was kept in position for several weeks. The case was regarded as one of hemorrhage into the small omental sac.

### *Berlin.*

#### SYPHILITIC MYOCARDITIS—CYSTS OF THE ANTRUM OF HIGHMORE—RHINOSCOPIA MEDIA.

At the session of the Union for Internal Medicine held January 18th, ROSENTHAL presented a young man who

acquired syphilis in 1895. Recently he made a considerable journey on a bicycle, drinking a great deal, and exhausting himself by hard riding. He presented the symptoms of rapid irregular pulse, a systolic murmur over the mitral and pulmonary valves, an increased second sound, and an extension of the cardiac dulness toward the right. Rosenthal looked upon the case as one of *syphilitic myocarditis*. The seat of the lesion often being determined by traumatism, in this case it was the heart which had been subjected to abuse. The prognosis was favorable.

At the Laryngological Society, October 30, 1896, ALEXANDER spoke of the cysts which arise from the mucous lining of the antrum of Highmore. He described seven cases in which the cysts contained a serous fluid. He admitted that the presence of such fluid free in the antrum, without the formation of a cyst, is theoretically possible, but thus far it has never been demonstrated.

KIRSTEIN spoke of his experience with a method of investigating the superior portions of the nose, proposed by Killian and called "rhinoscopia media." After cocainization a narrow speculum is introduced into the nasal cleft and opened. By this means the middle turbinate is dislocated, usually with an audible fracture. The procedure in some cases is easily carried out; in others, it is quite impracticable. The method is recommended only in those cases in which it is clinically important to obtain an accurate view of the superior nasal passages, for example, in cases of polyp. Kirstein has never seen any serious results follow this rather violent method of examination.

## SOCIETY PROCEEDINGS.

### THE NEW YORK COUNTY MEDICAL SOCIETY.

*Stated Meeting held February 22, 1897.*

The Vice-President, ROBERT A. MURRAY, M.D., in the Chair.

#### THE DIAGNOSIS OF MALARIA.

WILLIAM OSLER, M.D., of Baltimore, read a paper with this title. (See page 289).

#### DISCUSSION.

DR. WALTER B. JAMES said that he thought most physicians in this section of the country would agree with Dr. Osler that malarial fevers were fairly typical, and easy of recognition, even without the aid of the microscope. He had examined the blood of many patients in this city, since the time of Laveran's discovery of the plasmodium was proved to be correct, and he had come to the conclusion, as a result of these studies, that malaria, originating in New York City, was rare. Since he had relied upon this method of confirming the diagnosis of malaria, the cases of malaria had become much fewer. They usually originated in some other locality than New York City, or beyond the thickly settled portion of the city, or on some ground floor, or in a house near some extensive excavation. He had never found the parasite of the irregular or remittent malarial fevers in an individual whose history indicated that the disease had been contracted in this locality. He had found this parasite in a fair number of cases among sea-faring persons, and others who had most probably contracted the disease in other regions. His observations indicated that we had to deal here almost exclusively with the tertian parasite, or that form of the disease which is most easily recognized.

He wished at this time to say a word in favor of the old-fashioned clinical method of diagnosticating malarial fever, for it had seemed to him that the finer methods of diagnosis had somewhat blunted our other powers of observation. In his opinion, a careful study of the clinical aspect of almost every case of malaria in this city would result in a trustworthy clinical diagnosis. The absolute recognition of the parasite in the doubtful cases must be entrusted to the "malarial *expert*," for it must be rare to find a general practitioner whose training and experience had been sufficient to make him competent to establish the diagnosis in the *doubtful* cases—in other words, in just those cases in which the question of diagnosis assumes unusual importance.

DR. A. JACOBI said he agreed with the last speaker that in many cases the diagnosis could be made without recourse to the microscope, but the microscopical test was of much value, and it should not be forgotten that the best clinicians throughout the world had been exceedingly glad to be able to appeal to the microscope for a confirmation of the diagnosis of malaria.

As to the diagnosis, he would say that it was rare to find diseases in which there would be such a high elevation of temperature as in malaria, although, of course, at the beginning of a pneumonia or a tonsillitis such might occur. Again, he knew of no other disease in which the swelling of the spleen was so considerable as in malaria. When the spleen could be distinctly felt below the free border of the ribs within a few days, the probability was that the disease was malaria, and not typhoid fever. Ehrlich's diazo-test, it was true, was also observed in pneumonia, acute miliary tuberculosis, and other diseases, but in a great many instances he had found it serviceable for differentiating between malaria and typhoid fever in very doubtful cases. As a rule, he had not found the maroon discoloration that was observed in typhoid fever from the fourth to the fourteenth day. In cases of auto-infection, which might be conveniently termed "intestinal fever," there was an irregular fever which, in children, might last for a number of weeks. This affection was frequently mistaken for typhoid fever, and not infrequently for malarial fever. It was a common affection here, where children were [illegible]. In this affection there was usually only very slight swelling of the spleen. Its true nature was to be determined by watching the effect of a good purge and a restriction of the diet. In some cases of acute rachitis there would be found a fever presenting some of the features of malaria; indeed, a few very excellent clinicians had been led into error in this way. At one time he had seen here a number of cases of malaria originating in South Brooklyn, before that portion of the city had been properly sewered. In these cases, the prostration was very marked and persistent, and a distinct paroxysm of ague often failed to develop

for a long time. He had noticed, however, that after the first dose or two of quinin it was not very unusual for a severe paroxysm to occur. On pushing the remedy, improvement would be noted, and convalescence would soon be established. This rather remarkable phenomenon had puzzled him a good deal at the time. He had since endeavored to explain it by supposing that the administration of the quinin at first had caused a contraction of the spleen, and that the constant return to the circulation of a number the malarial organisms had resulted in the development of the ague paroxysm.

Dr. E. Le Fevre said that he had made quite an extended study of malaria at Bellevue Hospital. The microscopical examination in the large majority of cases showed single or double groups of the tertian type. Two cases of the pernicious type had been admitted to the hospital with a diagnosis of apoplexy. One of these patients was an old lady, and the correct diagnosis had only been made in her case after finding a large number of the malarial organisms in her blood. She had had a continuous temperature of 104°, F., according to the records of another hospital, for some little time previously. The organisms disappeared rapidly under the use of quinin. The other case was that of a man who lived on the fourth story of an apartment house, and apparently under perfect sanitary surroundings. As far as could be ascertained from the history, this case had developed in New York City. His experience had been that quite a number of the cases had developed in the southern part of this city. Eleven of the cases had presented types of plasmodium that he had been unable to classify. In only a small percentage of the cases had it been possible to feel the spleen below the free border of the ribs.

Dr. S. Baruch said that having been at one time a resident of the Southern States he had had extensive experience with true malaria. He regarded the diagnosis of malarial fever as more easily made than in any other disease. He depended more upon the temperature than on any other sign. It was not the height of the temperature so much as the difference between the temperature at the beginning of the paroxysm and that at its acme. Such large excursions of temperature were not observed in any other common disease. It was, however, observed sometimes in gall-stone fever and in ulcerative endocarditis. One observer had noted the occurrence of a similar fever in those addicted to morphin. In his experience, splenic enlargement had been so infrequent in the early stages as to be of little importance in making the diagnosis.

Mention had been made in the paper of the large number of recorded cases in which malaria had been alleged to be the cause of death in this city and Brooklyn. In a paper published by him in 1881 he had directed attention to this subject, and had shown that out of 130 reported cases of this kind, careful inquiry had shown that in only thirty had the physicians who had thus signed the death certificates been willing to state positively that, in their opinion, malarial fever had really caused death.

Dr. Osler, in closing the discussion, said that his statement regarding the number of reported fatal cases in this section of the country had been founded on the figures given in the United States census for the six years ending in 1890. According to such statistics, the mortality from malaria was simply appalling, but in all probability nearly all of these cases were really typhoid fever. He had taken pains to make inquiry in both New York and Brooklyn, and had learned that fatal cases of malaria were exceedingly rare in those cities. The sooner the physicians of the North learned that north of the Chesapeake death from malarial fever was exceedingly rare, the better for the accuracy of our statistics. He could not agree with those who had stated that splenic enlargement was rarely observed in the early stages of malaria. If the patient were placed on the side, and the hands used to push the spleen up toward the palpating finger, there would be little difficulty in most instances in feeling the enlarged spleen. The clinical diagnosis of ordinary malaria was exceedingly easy; it should be possible to make it in about nineteen out of twenty cases from the facies alone, after the affection had lasted for a week or ten days. The fresh, or untreated cases usually gave a very distinctive paroxysm. The height of the fever was certainly an important factor in the diagnosis. It should be recognized that the irregular type of fever might produce a definite and specific fever, and the paroxysm would be found different from the other form. In these exceptional cases, the temperature curve was very much longer. He had seen two instances in which the fever in a morphin habitué closely resembled malaria, but in these cases no malarial organisms were found.

In conclusion, he would say that malarial fever was a very rare disease north of "Mason and Dixon's line"—except in the heads of the doctors.

## REVIEW.

The Etiology, Symptoms, and Treatment of Gall-stones. By Dr. J. Kraus, Sr., of Carlsbad, with additional remarks on Operative Treatment by Henry Morris, M.B. (Lond.), F.R.C.S., Surgeon to the Middlesex Hospital. London: Kegan, Paul, Trench, Trübner & Co., 1896.

This little book, a translation by the author of his "Beitrage zur Pathologie und Therapie der Gallensteine," offers a clear and very readable account of the troubles caused by gall-stones, and their treatment. Written by a physician at Carlsbad—that Mecca of gall-stone sufferers—we are not surprised to find therein an excellent account of the disease. The author discusses the morphology of gall-stones, their etiology, symptoms, diagnosis, prognosis, and treatment. Dr. Kraus lays considerable stress on what he calls the "prodromal state of cholelithiasis," and expresses surprise at finding so little mention of it in literature. He deplores the fact that so few patients come under the physician's care during this stage. Kraus is a firm believer in the virtues of Carlsbad in the treatment of gall-stones, but declares that a course of the waters at home, if properly used and directed, would meet with the same success as at Carlsbad itself.

Mr. Henry Morris contributes a short account of "The Surgical Treatment of Gall-stones and the Complications Arising from Them." According to Morris, aspiration of the gall-bladder with trocar and canula should never be attempted. To any one who desires a clear and concise account of the subject, we recommend this little volume.